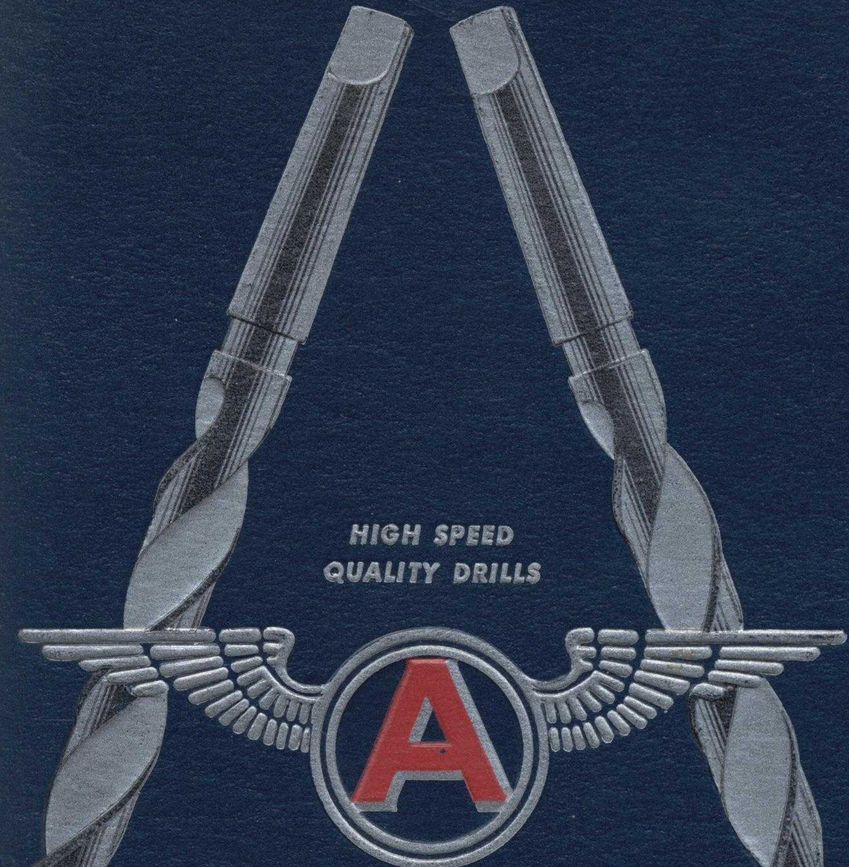

HIGH SPEED
QUALITY DRILLS

AMERICAN TWIST DRILL COMPANY

DETROIT 27, MICHIGAN

COMPLETE CATALOG

OF THE

AMERICAN TWIST DRILL COMPANY

Manufacturers of

HIGH SPEED TWIST DRILLS

High Speed Quality Drills

CATALOG No. 22

Represented By
CHAS. D. CONNER
510 Plymouth Rd.
Glenside, Pa.

Issued 1947

14301 W. CHICAGO BOULEVARD

DETROIT 27, MICHIGAN

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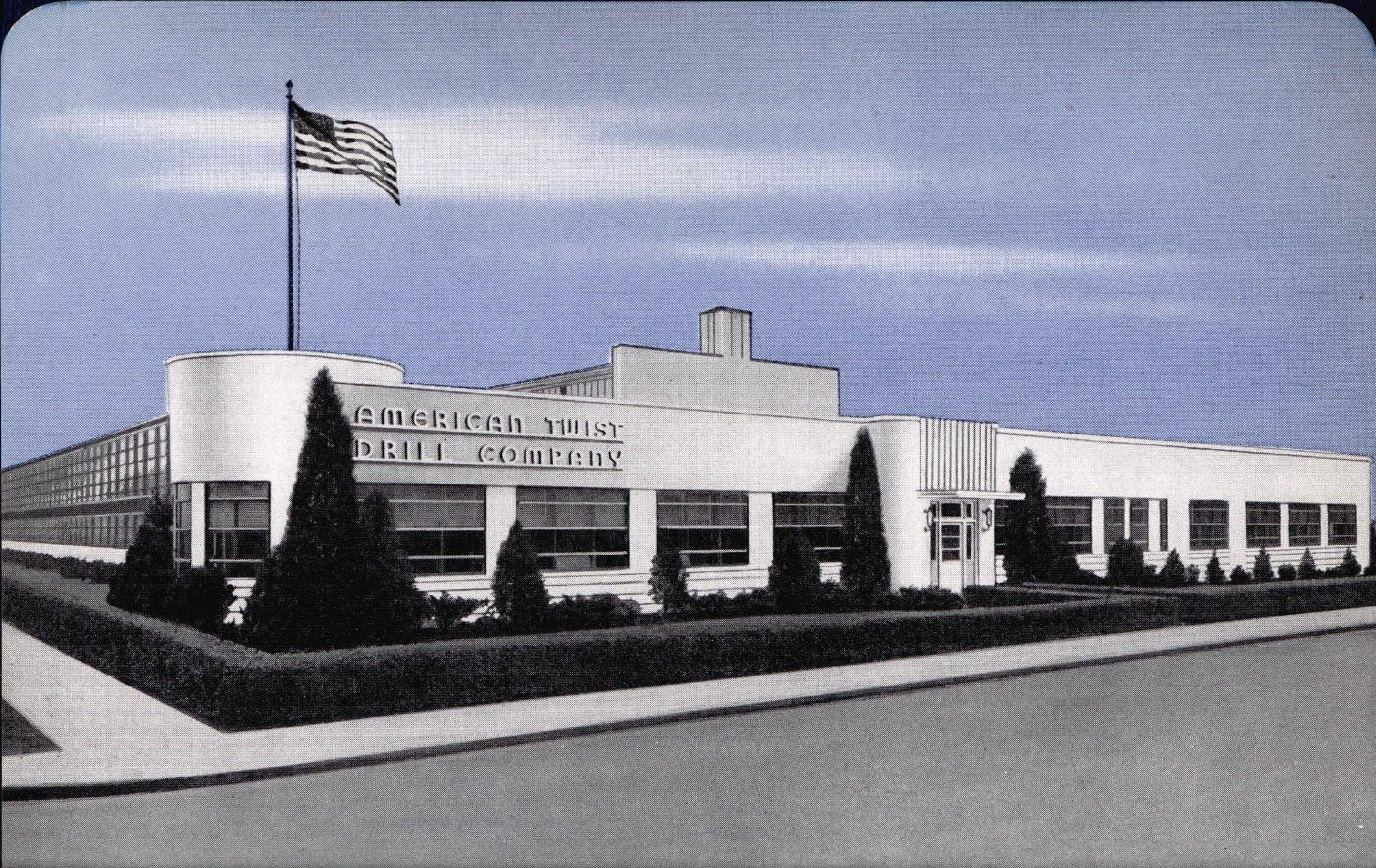
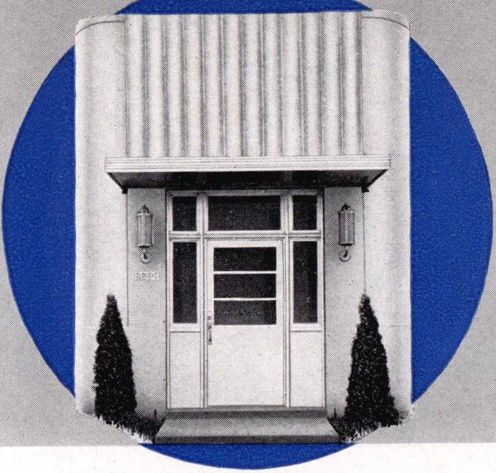

AMERICAN TWIST
DRILL COMPANY



High Speed Quality Drills

THE home of the American Twist Drill Company, built in 1936 and greatly enlarged in recent years, symbolizes thirty years of progressive development. Modern construction and the finest equipment available combine to match the outstanding quality of our product.

Throughout this plant the air is carefully conditioned. Dust and odors are removed; the air is circulated constantly, and is kept at a uniform humidity. Ceiling-height windows admit a maximum amount of daylight. At night the factory is illuminated with mercury-vapor lamps—the most modern, scientific lighting system known.

In the pages that follow you will find specifications and prices on a complete line of quality high speed twist drills. All are of the highest grade materials; all embody the latest developments in design and workmanship; all are manufactured under ideal conditions in the most modern plant of its kind in the country.

High Speed Quality Drills

A

AMERICAN TWIST DRILL COMPANY

HIGH SPEED
Regular Taper Shank
List No. 101

Diam. Inches	Dec. Equiv.	List Price Each	No. of Taper Shank	Length Over All Inches	Length Flute Inches
1/8	.125	$1.00	1	5 1/8	1 13/16
9/64	.1406	1.10	1	5 3/8	2 1/16
5/32	.1562	1.10	1	5 3/8	2 1/16
11/64	.1718	1.25	1	5 3/4	2 5/16
3/16	.1875	1.25	1	5 3/4	2 7/16
13/64	.2031	1.35	1	6	2 9/16
7/32	.2187	1.35	1	6	2 11/16
15/64	.2343	1.40	1	6 1/8	2 13/16
1/4	.250	1.40	1	6 1/8	2 13/16
17/64	.2656	1.50	1	6 1/4	2 15/16
9/32	.2812	1.50	1	6 1/4	2 15/16
19/64	.2968	1.60	1	6 3/8	3 1/16
5/16	.3125	1.60	1	6 3/8	3 1/16
21/64	.3281	1.70	1	6 1/2	3 3/16
11/32	.3437	1.70	1	6 1/2	3 3/16
23/64	.3593	1.90	1	6 3/4	3 7/16
3/8	.375	1.90	1	6 3/4	3 7/16
25/64	.3906	2.10	1	7	3 11/16
13/32	.4062	2.10	1	7	3 11/16
27/64	.4218	2.30	1	7 1/4	3 15/16
7/16	.4375	2.30	1	7 1/4	3 15/16
29/64	.4531	2.50	1	7 1/2	4 3/16
15/32	.4687	2.50	1	7 1/2	4 3/16
31/64	.4843	2.95	2	8 1/4	4 3/8
1/2	.500	2.95	2	8 1/4	4 3/8
33/64	.5156	3.25	2	8 1/2	4 5/8
17/32	.5312	3.25	2	8 1/2	4 5/8
35/64	.5468	3.75	2	8 3/4	4 7/8
9/16	.5625	3.75	2	8 3/4	4 7/8
37/64	.5781	4.00	2	8 3/4	4 7/8
19/32	.5937	4.00	2	8 3/4	4 7/8
39/64	.6093	4.25	2	8 3/4	4 7/8
5/8	.625	4.25	2	8 3/4	4 7/8
41/64	.6406	4.75	2	9	5 1/8

Always give List Number when ordering.
See pages 28 and 29 for Drills of special application.

High Speed Quality Drills

HIGH SPEED. Regular Taper Shank
List No. 101

Diam. Inches	Dec. Equiv.	List Price Each	No. of Taper Shank	Length Over All Inches	Length Flute Inches
21/32	.6562	$ 4.75	2	9	5 1/8
43/64	.6718	5.25	2	9 1/4	5 3/8
11/16	.6875	5.25	2	9 1/4	5 3/8
45/64	.7031	5.75	2	9 1/2	5 5/8
23/32	.7187	5.75	2	9 1/2	5 5/8
47/64	.7343	6.25	2	9 3/4	5 7/8
3/4	.750	6.25	2	9 3/4	5 7/8
49/64	.7656	6.50	2	9 7/8	6
25/32	.7812	6.50	2	9 7/8	6
51/64	.7968	7.25	3	10 3/4	6 1/8
13/16	.8125	7.25	3	10 3/4	6 1/8
53/64	.8281	7.65	3	10 3/4	6 1/8
27/32	.8437	7.65	3	10 3/4	6 1/8
55/64	.8593	8.05	3	10 3/4	6 1/8
7/8	.875	8.05	3	10 3/4	6 1/8
57/64	.8906	8.45	3	10 3/4	6 1/8
29/32	.9062	8.45	3	10 3/4	6 1/8
59/64	.9218	8.85	3	10 3/4	6 1/8
15/16	.9375	8.85	3	10 3/4	6 1/8
61/64	.9531	9.65	3	11	6 3/8
31/32	.9687	9.65	3	11	6 3/8
63/64	.9843	10.25	3	11	6 3/8
1	1.0000	10.25	3	11	6 3/8
1 1/64	1.0156	11.00	3	11 1/8	6 1/2
1 1/32	1.0312	11.00	3	11 1/8	6 1/2
1 3/64	1.0468	11.75	3	11 1/4	6 5/8
1 1/16	1.0625	11.75	3	11 1/4	6 5/8
1 5/64	1.0781	13.25	4	12 1/2	6 7/8
1 3/32	1.0937	13.25	4	12 1/2	6 7/8
1 7/64	1.1093	14.25	4	12 3/4	7 1/8
1 1/8	1.125	14.25	4	12 3/4	7 1/8
1 9/64	1.1406	15.00	4	12 7/8	7 1/4
1 5/32	1.1562	15.00	4	12 7/8	7 1/4
1 11/64	1.1718	15.75	4	13	7 3/8
1 3/16	1.1875	15.75	4	13	7 3/8
1 13/64	1.2031	16.50	4	13 1/8	7 1/2

Always give List Number when ordering.
See pages 28 and 29 for Drills of special application.

High Speed Quality Drills

HIGH SPEED. Regular Taper Shank
List No. 101

Diam. Inches	Dec. Equiv.	List Price Each	No. of Taper Shank	Length Over All Inches	Length Flute Inches
1 7/32	1.2187	$16.50	4	13 1/8	7 1/2
1 15/64	1.2343	18.00	4	13 1/2	7 7/8
1 1/4	1.250	18.00	4	13 1/2	7 7/8
1 17/64	1.2656	20.00	4	14 1/8	8 1/2
1 9/32	1.2812	20.00	4	14 1/8	8 1/2
1 19/64	1.2968	20.75	4	14 1/4	8 5/8
1 5/16	1.3125	20.75	4	14 1/4	8 5/8
1 21/64	1.3281	21.50	4	14 3/8	8 3/4
1 11/32	1.3437	21.50	4	14 3/8	8 3/4
1 23/64	1.3593	22.25	4	14 1/2	8 7/8
1 3/8	1.375	22.25	4	14 1/2	8 7/8
1 25/64	1.3906	23.00	4	14 5/8	9
1 13/32	1.4062	23.00	4	14 5/8	9
1 27/64	1.4218	23.75	4	14 3/4	9 1/8
1 7/16	1.4375	23.75	4	14 3/4	9 1/8
1 29/64	1.4531	24.50	4	14 7/8	9 1/4
1 15/32	1.4687	24.50	4	14 7/8	9 1/4
1 31/64	1.4843	25.25	4	15	9 3/8
1 1/2	1.500	25.25	4	15	9 3/8
1 33/64	1.5156	28.75	5	16 3/8	9 1/2
1 17/32	1.5312	28.75	5	16 3/8	9 1/2
1 35/64	1.5468	30.75	5	16 5/8	9 5/8
1 9/16	1.5625	30.75	5	16 5/8	9 5/8
1 37/64	1.5781	32.75	5	16 7/8	9 7/8
1 19/32	1.5937	32.75	5	16 7/8	9 7/8
1 39/64	1.6093	34.00	5	17	10
1 5/8	1.625	34.00	5	17	10
1 41/64	1.6406	35.25	5	17 1/8	10 1/8
1 21/32	1.6562	35.25	5	17 1/8	10 1/8
1 43/64	1.6718	36.50	5	17 1/8	10 1/8
1 11/16	1.6875	36.50	5	17 1/8	10 1/8
1 45/64	1.7031	37.75	5	17 1/8	10 1/8
1 23/32	1.7187	37.75	5	17 1/8	10 1/8
1 47/64	1.7343	39.00	5	17 1/8	10 1/8
1 3/4	1.750	39.00	5	17 1/8	10 1/8
1 25/32	1.7812	40.25	5	17 1/8	10 1/8

Always give List Number when ordering.
See pages 28 and 29 for Drills of special application.

High Speed Quality Drills

HIGH SPEED. Regular Taper Shank
List No. 101

Diam. Inches	Dec. Equiv.	List Price Each	No. of Taper Shank	Length Over All Inches	Length Flute Inches
1 13/16	1.8125	$ 41.50	5	17 1/8	10 1/8
1 27/32	1.8437	42.75	5	17 1/8	10 1/8
1 7/8	1.875	45.00	5	17 3/8	10 1/2
1 29/32	1.9062	46.25	5	17 3/8	10 1/2
1 15/16	1.9375	47.50	5	17 3/8	10 1/2
1 31/32	1.9687	48.75	5	17 3/8	10 1/2
2	2.000	50.00	5	17 3/8	10 1/2
2 1/32	2.0312	51.75	5	17 3/8	10 1/2
2 1/16	2.0625	53.50	5	17 3/8	10 1/2
2 3/32	2.0937	55.25	5	17 3/8	10 1/2
2 1/8	2.125	57.00	5	17 3/8	10 1/2
2 5/32	2.1562	58.75	5	17 3/8	10 1/2
2 3/16	2.1875	60.50	5	17 3/8	10 1/2
2 7/32	2.2187	62.25	5	17 3/8	10 1/2
2 1/4	2.250	64.00	5	17 3/8	10 1/2
2 5/16	2.3125	67.50	5	17 3/8	10 1/2
2 3/8	2.375	71.00	5	17 3/8	10 1/2
2 7/16	2.4375	87.50	5	18 3/4	11 7/8
2 1/2	2.500	91.00	5	18 3/4	11 7/8
2 9/16	2.5625	100.00	5	19 1/2	12 1/2
2 5/8	2.625	105.00	5	19 1/2	12 1/2
2 11/16	2.6875	115.50	5	20 3/8	13 3/8
2 3/4	2.750	120.50	5	20 3/8	13 3/8
2 13/16	2.8125	129.50	5	21 1/8	14 1/8
2 7/8	2.875	135.00	5	21 1/8	14 1/8
2 15/16	2.9375	142.50	5	21 3/4	14 3/4
3	3.000	150.00	5	21 3/4	14 3/4
3 1/16	3.0625	178.00	6	24 7/16	15 1/8
3 1/8	3.125	189.00	6	24 7/16	15 1/8
3 3/16	3.1875	200.00	6	24 7/16	15 1/8
3 1/4	3.250	216.00	6	25 7/16	16 1/8
3 5/16	3.3125	232.00	6	25 7/16	16 1/8
3 3/8	3.375	249.00	6	25 7/16	16 1/8
3 7/16	3.4375	266.00	6	25 7/16	16 1/8
3 1/2	3.500	287.00	6	26 7/16	17 1/8

Always give List Number when ordering.
See pages 28 and 29 for Drills of special application.

HIGH SPEED
Taper Shank, Letter Sizes
List No. 102

Letter Size	Dec. Equiv.	List Price Each	No. of Taper Shank	Length Over All Inches	Length Flute Inches
A	.234	$1.40	1	6 1/8	2 13/16
B	.238	1.40	1	6 1/8	2 13/16
C	.242	1.40	1	6 1/8	2 13/16
D	.246	1.40	1	6 1/8	2 13/16
E	.250	1.40	1	6 1/8	2 13/16
F	.257	1.50	1	6 1/4	2 15/16
G	.261	1.50	1	6 1/4	2 15/16
H	.266	1.50	1	6 1/4	2 15/16
I	.272	1.50	1	6 1/4	2 15/16
J	.277	1.50	1	6 1/4	2 15/16
K	.281	1.50	1	6 1/4	2 15/16
L	.290	1.60	1	6 3/8	3 1/16
M	.295	1.60	1	6 3/8	3 1/16
N	.302	1.60	1	6 3/8	3 1/16
O	.316	1.70	1	6 1/2	3 3/16
P	.323	1.70	1	6 1/2	3 3/16
Q	.332	1.70	1	6 1/2	3 3/16
R	.339	1.70	1	6 1/2	3 3/16
S	.348	1.90	1	6 3/4	3 7/16
T	.358	1.90	1	6 3/4	3 7/16
U	.368	1.90	1	6 3/4	3 7/16
V	.377	2.10	1	7	3 11/16
W	.386	2.10	1	7	3 11/16
X	.397	2.10	1	7	3 11/16
Y	.404	2.10	1	7	3 11/16
Z	.413	2.30	1	7 1/4	3 15/16
U	.368	2.10	2	7 3/8	3 7/16
V	.377	2.25	2	7 1/2	3 11/16
W	.386	2.25	2	7 1/2	3 11/16
X	.397	2.25	2	7 1/2	3 11/16
Y	.404	2.25	2	7 1/2	3 11/16
Z	.413	2.45	2	7 3/4	3 15/16

Number 1 shank will be furnished unless otherwise specified.
Always give List Number when ordering.
See pages 28 and 29 for Drills of special application.

HIGH SPEED
With Taper Shank Smaller than Regular
List No. 103

Diam. Inches	Dec. Equiv.	List Price Each	No. of Taper Shank	Length Over All Inches	Length Flute Inches
31/64	.4843	$ 2.75	1	7 3/4	4 7/16
1/2	.500	2.75	1	7 3/4	4 7/16
33/64	.5156	3.05	1	8	4 11/16
17/32	.5312	3.05	1	8	4 11/16
35/64	.5468	3.50	1	8 1/4	4 15/16
9/16	.5625	3.50	1	8 1/4	4 15/16
51/64	.7968	6.75	2	10	6 1/8
13/16	.8125	6.75	2	10	6 1/8
53/64	.8281	7.15	2	10	6 1/8
27/32	.8437	7.15	2	10	6 1/8
55/64	.8593	7.50	2	10	6 1/8
7/8	.875	7.50	2	10	6 1/8
57/64	.8906	7.85	2	10	6 1/8
29/32	.9062	7.85	2	10	6 1/8
1 5/64	1.0781	12.20	3	11 1/2	6 7/8
1 3/32	1.0937	12.20	3	11 1/2	6 7/8
1 7/64	1.1093	13.15	3	11 3/4	7 1/8
1 1/8	1.125	13.15	3	11 3/4	7 1/8
1 9/64	1.1406	13.85	3	11 7/8	7 1/4
1 5/32	1.1562	13.85	3	11 7/8	7 1/4
1 11/64	1.1718	14.55	3	12	7 3/8
1 3/16	1.1875	14.55	3	12	7 3/8
1 13/64	1.2031	15.25	3	12 1/8	7 1/2
1 7/32	1.2187	15.25	3	12 1/8	7 1/2
1 15/64	1.2343	16.65	3	12 1/2	7 7/8
1 1/4	1.250	16.65	3	12 1/2	7 7/8

Always give List Number when ordering.
See pages 28 and 29 for Drills of special application.

High Speed Quality Drills

HIGH SPEED. With Taper Shank Smaller than Regular
List No. 103

Diam. Inches	Dec. Equiv.	List Price Each	No. of Taper Shank	Length Over All Inches	Length Flute Inches
1 33/64	1.5156	$ 26.35	4	15	9 3/8
1 17/32	1.5312	26.35	4	15	9 3/8
1 35/64	1.5468	28.20	4	15 1/4	9 5/8
1 9/16	1.5625	28.20	4	15 1/4	9 5/8
1 37/64	1.5781	30.10	4	15 1/2	9 7/8
1 19/32	1.5937	30.10	4	15 1/2	9 7/8
1 39/64	1.6093	31.25	4	15 5/8	10
1 5/8	1.625	31.25	4	15 5/8	10
1 41/64	1.6406	32.40	4	15 3/4	10 1/8
1 21/32	1.6562	32.40	4	15 3/4	10 1/8
1 43/64	1.6718	33.55	4	15 3/4	10 1/8
1 11/16	1.6875	33.55	4	15 3/4	10 1/8
1 45/64	1.7031	34.70	4	15 3/4	10 1/8
1 23/32	1.7187	34.70	4	15 3/4	10 1/8
1 47/64	1.7343	37.00	4	16 1/4	10 1/8
1 3/4	1.750	37.00	4	16 1/4	10 1/8
1 25/32	1.7812	38.20	4	16 1/4	10 1/8
1 13/16	1.8125	39.40	4	16 1/4	10 1/8
1 27/32	1.8437	40.55	4	16 1/4	10 1/8
1 7/8	1.875	42.75	4	16 1/2	10 1/2
1 29/32	1.9062	43.95	4	16 1/2	10 1/2
1 15/16	1.9375	45.45	4	16 5/8	10 1/2
1 31/32	1.9687	46.65	4	16 5/8	10 1/2
2	2.000	47.85	4	16 5/8	10 1/2
3 1/16	3.0625	160.00	5	22	15
3 1/8	3.125	170.00	5	22	15
3 3/16	3.1875	180.00	5	22	15
3 1/4	3.250	195.00	5	23	16
3 5/16	3.3125	210.00	5	23	16
3 3/8	3.375	225.00	5	23	16
3 7/16	3.4375	240.00	5	23	16
3 1/2	3.500	260.00	5	24	17

Always give List Number when ordering.
See pages 28 and 29 for Drills of special application.

HIGH SPEED

With Taper Shank Larger than Regular

List No. 104

Diam. Inches	Dec. Equiv.	List Price Each	No. of Taper Shank	Length Over All Inches	Length Flute Inches
3/8	.375	$ 2.10	2	7 3/8	3 7/16
25/64	.3906	2.25	2	7 1/2	3 11/16
13/32	.4062	2.25	2	7 1/2	3 11/16
27/64	.4218	2.45	2	7 3/4	3 15/16
7/16	.4375	2.45	2	7 3/4	3 15/16
29/64	.4531	2.65	2	8	4 3/16
15/32	.4687	2.65	2	8	4 3/16
41/64	.6406	5.15	3	9 3/4	5 1/8
21/32	.6562	5.15	3	9 3/4	5 1/8
43/64	.6718	5.70	3	10	5 3/8
11/16	.6875	5.70	3	10	5 3/8
45/64	.7031	6.20	3	10 1/4	5 5/8
23/32	.7187	6.20	3	10 1/4	5 5/8
47/64	.7343	6.75	3	10 1/2	5 7/8
3/4	.750	6.75	3	10 1/2	5 7/8
49/64	.7656	7.00	3	10 5/8	6
25/32	.7812	7.00	3	10 5/8	6
1	1.000	11.20	4	12	6 3/8
1 1/64	1.0156	12.00	4	12 1/8	6 1/2
1 1/32	1.0312	12.00	4	12 1/8	6 1/2
1 3/64	1.0468	12.80	4	12 1/4	6 5/8
1 1/16	1.0625	12.80	4	12 1/4	6 5/8

Always give List Number when ordering.
See pages 28 and 29 for Drills of special application.

HIGH SPEED
Straight Shank Taper Length
List No. 105

Diam. Inches	Dec. Equiv.	List Price Each	Length Over All Inches	Length Flute Inches
1/8	.125	$1.00	5 1/8	2 1/2
9/64	.1406	1.10	5 3/8	3
5/32	.1562	1.10	5 3/8	3
11/64	.1718	1.25	5 3/4	3 1/2
3/16	.1875	1.25	5 3/4	3 1/2
13/64	.2031	1.35	6	3 7/8
7/32	.2187	1.35	6	3 7/8
15/64	.2343	1.40	6 1/8	4
1/4	.250	1.40	6 1/8	4
17/64	.2656	1.50	6 1/4	4
9/32	.2812	1.50	6 1/4	4
19/64	.2968	1.60	6 3/8	4 1/16
5/16	.3125	1.60	6 3/8	4 1/16
21/64	.3281	1.70	6 1/2	4 1/8
11/32	.3437	1.70	6 1/2	4 1/8
23/64	.3593	1.90	6 3/4	4 1/4
3/8	.375	1.90	6 3/4	4 1/4
25/64	.3906	2.10	7	4 3/8
13/32	.4062	2.10	7	4 3/8
27/64	.4218	2.30	7 1/4	4 5/8
7/16	.4375	2.30	7 1/4	4 5/8
29/64	.4531	2.50	7 1/2	4 7/8
15/32	.4687	2.50	7 1/2	4 7/8
31/64	.4843	2.75	7 3/4	5
1/2	.500	2.75	7 3/4	5
33/64	.5156	3.05	8	5 1/4
17/32	.5312	3.05	8	5 1/4
35/64	.5468	3.50	8 1/4	5 3/8
9/16	.5625	3.50	8 1/4	5 3/8
37/64	.5781	4.00	8 3/4	5 3/4
19/32	.5937	4.00	8 3/4	5 3/4
39/64	.6093	4.25	8 3/4	5 3/4
5/8	.625	4.25	8 3/4	5 3/4
41/64	.6406	4.75	9	5 7/8
21/32	.6562	4.75	9	5 7/8
43/64	.6718	5.25	9 1/4	6
11/16	.6875	5.25	9 1/4	6
45/64	.7031	5.75	9 1/2	6 3/16
23/32	.7187	5.75	9 1/2	6 3/16
47/64	.7343	6.25	9 3/4	6 3/8
3/4	.750	6.25	9 3/4	6 3/8
49/64	.7656	6.50	9 7/8	6 1/2
25/32	.7812	6.50	9 7/8	6 1/2
51/64	.7968	6.75	10	6 5/8

Always give List Number when ordering.
See pages 28 and 29 for Drills of special application.

HIGH SPEED. Straight Shank Taper Length
List No. 105

Diam. Inches	Dec. Equiv.	List Price Each	Length Over All Inches	Length Flute Inches
13/16	.8125	$ 6.75	10	6 5/8
53/64	.8281	7.15	10	6 5/8
27/32	.8437	7.15	10	6 5/8
55/64	.8593	7.50	10	6 5/8
7/8	.875	7.50	10	6 5/8
57/64	.8906	7.85	10	6 5/8
29/32	.9062	7.85	10	6 5/8
59/64	.9218	8.85	10 3/4	7
15/16	.9375	8.85	10 3/4	7
61/64	.9531	9.65	11	7 1/8
31/32	.9687	9.65	11	7 1/8
63/64	.9843	10.25	11	7 1/8
1	1.000	10.25	11	7 1/8
1 1/64	1.0156	11.00	11 1/8	7 5/16
1 1/32	1.0312	11.00	11 1/8	7 5/16
1 3/64	1.0468	11.75	11 1/4	7 3/8
1 1/16	1.0625	11.75	11 1/4	7 3/8
1 5/64	1.0781	12.20	11 1/2	7 5/8
1 3/32	1.0937	12.20	11 1/2	7 5/8
1 7/64	1.1093	13.15	11 3/4	7 7/8
1 1/8	1.125	13.15	11 3/4	7 7/8
1 9/64	1.1406	13.85	11 7/8	8
1 5/32	1.1562	13.85	11 7/8	8
1 11/64	1.1718	14.55	12	8 1/8
1 3/16	1.1875	14.55	12	8 1/8
1 13/64	1.2031	15.25	12 1/8	8 1/4
1 7/32	1.2187	15.25	12 1/8	8 1/4
1 15/64	1.2343	16.65	12 1/2	8 1/2
1 1/4	1.250	16.65	12 1/2	8 1/2
1 9/32	1.2812	20.00	14 1/8	10 1/8
1 5/16	1.3125	20.75	14 1/4	10 1/4
1 11/32	1.3437	21.50	14 3/8	10 3/8
1 3/8	1.375	22.25	14 1/2	10 1/2
1 13/32	1.4062	23.00	14 5/8	10 5/8
1 7/16	1.4375	23.75	14 3/4	10 3/4
1 15/32	1.4687	24.50	14 7/8	10 7/8
1 1/2	1.500	25.25	15	11
1 9/16	1.5625	28.20	15 1/4	11 1/4
1 5/8	1.625	31.25	15 5/8	11 5/8
1 11/16	1.6875	33.55	15 3/4	11 3/4
1 3/4	1.750	37.00	16 1/4	12 1/4
1 13/16	1.8125	39.40	16 1/4	12 1/4
1 7/8	1.875	42.75	16 1/2	12 1/2
1 15/16	1.9375	45.45	16 5/8	12 5/8
2	2.000	47.85	16 5/8	12 5/8

Always give List Number when ordering.
See pages 28 and 29 for Drills of special application.

THREE FLUTED DRILLS
HIGH SPEED STEEL
With Regular Taper Shank
List No. 106

Diam. Inches	Dec. Equiv.	List Price Each	No. of Taper Shank	Length Over All Inches	Length Flute Inches
1/4	.250	$ 2.75	1	6 1/8	2 13/16
9/32	.2812	2.85	1	6 1/4	2 15/16
5/16	.3125	2.95	1	6 3/8	3 1/16
11/32	.3437	3.05	1	6 1/2	3 3/16
3/8	.375	3.25	1	6 3/4	3 7/16
13/32	.4062	3.45	1	7	3 11/16
7/16	.4375	3.65	1	7 1/4	3 15/16
15/32	.4687	3.85	1	7 1/2	4 3/16
1/2	.500	4.30	2	8 1/4	4 3/8
17/32	.5312	4.60	2	8 1/2	4 5/8
9/16	.5625	5.10	2	8 3/4	4 7/8
19/32	.5937	5.35	2	8 3/4	4 7/8
5/8	.625	5.60	2	8 3/4	4 7/8
21/32	.6562	6.10	2	9	5 1/8
11/16	.6875	6.60	2	9 1/4	5 3/8
23/32	.7187	7.10	2	9 1/2	5 5/8
3/4	.750	7.60	2	9 3/4	5 7/8
25/32	.7812	8.00	2	9 7/8	6
13/16	.8125	9.00	3	10 3/4	6 1/8
27/32	.8437	9.50	3	10 3/4	6 1/8
7/8	.875	10.00	3	10 3/4	6 1/8
29/32	.9062	10.50	3	10 3/4	6 1/8
15/16	.9375	11.00	3	10 3/4	6 1/8
31/32	.9687	12.00	3	11	6 3/8
1	1.000	12.75	3	11	6 3/8
1 1/32	1.0312	13.50	3	11 1/8	6 1/2
1 1/16	1.0625	14.25	3	11 1/4	6 5/8
1 3/32	1.0937	15.75	4	12 1/2	6 7/8
1 1/8	1.125	16.75	4	12 3/4	7 1/8
1 5/32	1.1562	17.75	4	12 7/8	7 1/4
1 3/16	1.1875	18.75	4	13	7 3/8
1 7/32	1.2187	19.75	4	13 1/8	7 1/2
1 1/4	1.250	21.75	4	13 1/2	7 7/8
1 9/32	1.2812	23.75	4	14 1/8	8 1/2
1 5/16	1.3125	24.75	4	14 1/4	8 5/8
1 11/32	1.3437	25.75	4	14 3/8	8 3/4
1 3/8	1.375	26.75	4	14 1/2	8 7/8

Always give List Number when ordering.
See pages 28 and 29 for Drills of special application.

High Speed Quality Drills

THREE FLUTED DRILLS. HIGH SPEED STEEL
With Regular Taper Shank
List No. 106

Diam. Inches	Dec. Equiv.	List Price Each	No. of Taper Shank	Length Over All Inches	Length Flute Inches
1 13/32	1.4062	$ 28.00	4	14 5/8	9
1 7/16	1.4375	29.25	4	14 3/4	9 1/8
1 15/32	1.4687	30.50	4	14 7/8	9 1/4
1 1/2	1.500	31.75	4	15	9 3/8
1 17/32	1.5312	35.50	5	16 3/8	9 1/2
1 9/16	1.5625	37.50	5	16 5/8	9 3/4
1 19/32	1.5937	39.50	5	16 7/8	10
1 5/8	1.625	41.00	5	17	10 1/8
1 21/32	1.6562	42.50	5	17 1/8	10 1/4
1 11/16	1.6875	44.00	5	17 1/8	10 1/4
1 23/32	1.7187	45.50	5	17 1/8	10 1/4
1 3/4	1.750	47.00	5	17 1/8	10 1/4
1 25/32	1.7812	48.50	5	17 1/8	10 1/4
1 13/16	1.8125	50.00	5	17 1/8	10 1/4
1 27/32	1.8437	51.50	5	17 1/8	10 1/4
1 7/8	1.875	54.50	5	17 3/8	10 1/2
1 29/32	1.9062	56.25	5	17 3/8	10 1/2
1 15/16	1.9375	58.00	5	17 3/8	10 1/2
1 31/32	1.9687	59.75	5	17 3/8	10 1/2
2	2.000	61.50	5	17 3/8	10 1/2
2 1/32	2.0312	63.25	5	17 3/8	10 1/2
2 1/16	2.0625	65.00	5	17 3/8	10 1/2
2 1/8	2.125	68.50	5	17 3/8	10 1/2
2 3/16	2.1875	72.00	5	17 3/8	10 1/2
2 1/4	2.250	75.50	5	17 3/8	10 1/2
2 5/16	2.3125	79.50	5	17 3/8	10 1/2
2 3/8	2.375	83.50	5	17 3/8	10 1/2
2 7/16	2.4375	101.50	5	18 3/4	11 3/4
2 1/2	2.500	105.00	5	18 3/4	11 3/4
2 9/16	2.5625	115.50	5	19 1/2	12 1/2
2 5/8	2.625	122.00	5	19 1/2	12 1/2
2 11/16	2.6875	135.00	5	20 3/8	13 3/8
2 3/4	2.750	143.00	5	20 3/8	13 3/8
2 13/16	2.8125	155.00	5	21 1/8	14 1/8
2 7/8	2.875	163.00	5	21 1/8	14 1/8
2 15/16	2.9375	174.00	5	21 3/4	14 3/4
3	3.000	185.00	5	21 3/4	14 3/4

Always give List Number when ordering.
See pages 28 and 29 for Drills of special application.

FOUR FLUTED DRILLS. HIGH SPEED STEEL
With Regular Taper Shank
List No. 107

Diam. Inches	Dec. Equiv.	List Price Each	No. of Taper Shank	Length Over All Inches	Length Flute Inches
1/2	.500	$ 4.30	2	8 1/4	4 3/8
17/32	.5312	4.60	2	8 1/2	4 5/8
9/16	.5625	5.10	2	8 3/4	4 7/8
19/32	.5937	5.35	2	8 3/4	4 7/8
5/8	.625	5.60	2	8 3/4	4 7/8
21/32	.6562	6.10	2	9	5 1/8
11/16	.6875	6.60	2	9 1/4	5 3/8
23/32	.7187	7.10	2	9 1/2	5 5/8
3/4	.750	7.60	2	9 3/4	5 7/8
25/32	.7812	8.00	2	9 7/8	6
13/16	.8125	9.00	3	10 3/4	6 1/8
27/32	.8437	9.50	3	10 3/4	6 1/8
7/8	.875	10.00	3	10 3/4	6 1/8
29/32	.9062	10.50	3	10 3/4	6 1/8
15/16	.9375	11.00	3	10 3/4	6 1/8
31/32	.9687	12.00	3	11	6 3/8
1	1.000	12.75	3	11	6 3/8
1 1/32	1.0312	13.50	3	11 1/8	6 1/2
1 1/16	1.0625	14.25	3	11 1/4	6 5/8
1 3/32	1.0937	15.75	4	12 1/2	6 7/8
1 1/8	1.125	16.75	4	12 3/4	7 1/8
1 5/32	1.1562	17.75	4	12 7/8	7 1/4
1 3/16	1.1875	18.75	4	13	7 3/8
1 7/32	1.2187	19.75	4	13 1/8	7 1/2
1 1/4	1.250	21.75	4	13 1/2	7 7/8
1 9/32	1.2812	23.75	4	14 1/8	8 1/2
1 5/16	1.3125	24.75	4	14 1/4	8 5/8
1 11/32	1.3437	25.75	4	14 3/8	8 3/4
1 3/8	1.375	26.75	4	14 1/2	8 7/8
1 13/32	1.4062	28.00	4	14 5/8	9
1 7/16	1.4375	29.25	4	14 3/4	9 1/8
1 15/32	1.4687	30.50	4	14 7/8	9 1/4
1 1/2	1.500	31.75	4	15	9 3/8

Always give List Number when ordering.
See pages 28 and 29 for Drills of special application.

FOUR FLUTED DRILLS. HIGH SPEED STEEL
With Regular Taper Shank
List No. 107

Diam. Inches	Dec. Equiv.	List Price Each	No. of Taper Shank	Length Over All Inches	Length Flute Inches
1 17/32	1.5312	$ 35.50	5	16 3/8	9 1/2
1 9/16	1.5625	37.50	5	16 5/8	9 3/4
1 19/32	1.5937	39.50	5	16 7/8	10
1 5/8	1.625	41.00	5	17	10 1/8
1 21/32	1.6562	42.50	5	17 1/8	10 1/4
1 11/16	1.6875	44.00	5	17 1/8	10 1/4
1 23/32	1.7187	45.50	5	17 1/8	10 1/4
1 3/4	1.750	47.00	5	17 1/8	10 1/4
1 25/32	1.7812	48.50	5	17 1/8	10 1/4
1 13/16	1.8125	50.00	5	17 1/8	10 1/4
1 27/32	1.8437	51.50	5	17 1/8	10 1/4
1 7/8	1.875	54.50	5	17 3/8	10 1/2
1 29/32	1.9062	56.25	5	17 3/8	10 1/2
1 15/16	1.9375	58.00	5	17 3/8	10 1/2
1 31/32	1.9687	59.75	5	17 3/8	10 1/2
2	2.000	61.50	5	17 3/8	10 1/2
2 1/32	2.0312	63.25	5	17 3/8	10 1/2
2 1/16	2.0625	65.00	5	17 3/8	10 1/2
2 1/8	2.125	68.50	5	17 3/8	10 1/2
2 3/16	2.1875	72.00	5	17 3/8	10 1/2
2 1/4	2.250	75.50	5	17 3/8	10 1/2
2 5/16	2.3125	79.50	5	17 3/8	10 1/2
2 3/8	2.375	83.50	5	17 3/8	10 1/2
2 7/16	2.4375	101.50	5	18 3/4	11 3/4
2 1/2	2.500	105.00	5	18 3/4	11 3/4
2 9/16	2.5625	115.50	5	19 1/2	12 1/2
2 5/8	2.625	122.00	5	19 1/2	12 1/2
2 11/16	2.6875	135.00	5	20 3/8	13 3/8
2 3/4	2.750	143.00	5	20 3/8	13 3/8
2 13/16	2.8125	155.00	5	21 1/8	14 1/8
2 7/8	2.875	163.00	5	21 1/8	14 1/8
2 15/16	2.9375	174.00	5	21 3/4	14 3/4
3	3.000	185.00	5	21 3/4	14 3/4

Always give List Number when ordering.
See pages 28 and 29 for Drills of special application.

THREE FLUTED DRILLS. HIGH SPEED STEEL

With Straight Shank

List No. 108

All sizes have shank same diameter as body.

Diam. Inches	Dec. Equiv.	List Price Each	Length Over All Inches	Length Flute Inches
1/4	.250	$ 2.75	6 1/8	4
9/32	.2812	2.85	6 1/4	4
5/16	.3125	2.95	6 3/8	4 1/16
11/32	.3437	3.05	6 1/2	4 1/8
3/8	.375	3.25	6 3/4	4 1/4
13/32	.4062	3.45	7	4 3/8
7/16	.4375	3.65	7 1/4	4 5/8
15/32	.4687	3.85	7 1/2	4 7/8
1/2	.500	4.05	7 3/4	5
17/32	.5312	4.35	8	5 1/4
9/16	.5625	4.80	8 1/4	5 3/8
19/32	.5937	5.35	8 3/4	5 3/4
5/8	.625	5.60	8 3/4	5 3/4
21/32	.6562	6.10	9	5 7/8
11/16	.6875	6.60	9 1/4	6
23/32	.7187	7.10	9 1/2	6 3/16
3/4	.750	7.60	9 3/4	6 3/8
25/32	.7812	8.00	9 7/8	6 1/2
13/16	.8125	8.35	10	6 5/8
27/32	.8437	8.85	10	6 5/8
7/8	.875	9.30	10	6 5/8
29/32	.9062	9.75	10	6 5/8
15/16	.9375	11.00	10 3/4	7
31/32	.9687	12.00	11	7 1/8

Always give List Number when ordering.
See pages 28 and 29 for Drills of special application.

THREE FLUTED DRILLS. HIGH SPEED STEEL
With Straight Shank
List No. 108

All sizes have shank same diameter as body.

Diam. Inches	Dec. Equiv.	List Price Each	Length Over All Inches	Length Flute Inches
1	1.000	$12.75	11	7 1/8
1 1/32	1.0312	13.50	11 1/8	7 5/16
1 1/16	1.0625	14.25	11 1/4	7 3/8
1 3/32	1.0937	14.50	11 1/2	7 5/8
1 1/8	1.125	15.45	11 3/4	8 1/8
1 5/32	1.1562	16.40	11 7/8	8 1/4
1 3/16	1.1875	17.30	12	8 3/8
1 7/32	1.2187	18.25	12 1/8	8 1/2
1 1/4	1.250	20.15	12 1/2	8 1/2
1 9/32	1.2812	23.75	14 1/8	10 1/8
1 5/16	1.3125	24.75	14 1/4	10 1/4
1 11/32	1.3437	25.75	14 3/8	10 3/8
1 3/8	1.375	26.75	14 1/2	10 1/2
1 13/32	1.4062	28.00	14 5/8	10 5/8
1 7/16	1.4375	29.25	14 3/4	10 3/4
1 15/32	1.4687	30.50	14 7/8	10 7/8
1 1/2	1.500	31.75	15	11
1 9/16	1.5625	34.40	15 1/4	11 1/4
1 5/8	1.625	37.70	15 5/8	11 5/8
1 11/16	1.6875	40.45	15 3/4	11 3/4
1 3/4	1.750	44.60	16 1/4	12 1/4
1 13/16	1.8125	47.45	16 1/4	12 1/4
1 7/8	1.875	51.75	16 1/2	12 1/2
1 15/16	1.9375	55.50	16 5/8	12 5/8
2	2.000	58.85	16 5/8	12 5/8

Always give List Number when ordering.
See pages 28 and 29 for Drills of special application.

FOUR FLUTED DRILLS. HIGH SPEED STEEL

With Straight Shank

List No. 109

All sizes have shank same diameter as body.

Diam. Inches	Dec. Equiv.	List Price Each	Length Over All Inches	Length Flute Inches
1/2	.500	$ 4.05	7 3/4	5
17/32	.5312	4.35	8	5 1/4
9/16	.5625	4.80	8 1/4	5 3/8
19/32	.5937	5.35	8 3/4	5 3/4
5/8	.625	5.60	8 3/4	5 3/4
21/32	.6562	6.10	9	5 7/8
11/16	.6875	6.60	9 1/4	6
23/32	.7187	7.10	9 1/2	6 3/16
3/4	.750	7.60	9 3/4	6 3/8
25/32	.7812	8.00	9 7/8	6 1/2
13/16	.8125	8.35	10	6 5/8
27/32	.8437	8.85	10	6 5/8
7/8	.875	9.30	10	6 5/8
29/32	.9062	9.75	10	6 5/8
15/16	.9375	11.00	10 3/4	7
31/32	.9687	12.00	11	7 1/8
1	1.000	12.75	11	7 1/8
1 1/32	1.0312	13.50	11 1/8	7 5/16
1 1/16	1.0625	14.25	11 1/4	7 3/8
1 3/32	1.0937	14.50	11 1/2	7 5/8

Always give List Number when ordering.
See pages 28 and 29 for Drills of special application.

FOUR FLUTED DRILLS. HIGH SPEED STEEL

With Straight Shank

List No. 109

All sizes have shank same diameter as body.

Diam. Inches	Dec. Equiv.	List Price Each	Length Over All Inches	Length Flute Inches
1 1/8	1.125	$15.45	11 3/4	8 1/8
1 5/32	1.1562	16.40	11 7/8	8 1/4
1 3/16	1.1875	17.30	12	8 3/8
1 7/32	1.2187	18.25	12 1/8	8 1/2
1 1/4	1.250	20.15	12 1/2	8 1/2
1 9/32	1.2812	23.75	14 1/8	10 1/8
1 5/16	1.3125	24.75	14 1/4	10 1/4
1 11/32	1.3437	25.75	14 3/8	10 3/8
1 3/8	1.375	26.75	14 1/2	10 1/2
1 13/32	1.4062	28.00	14 5/8	10 5/8
1 7/16	1.4375	29.25	14 3/4	10 3/4
1 15/32	1.4687	30.50	14 7/8	10 7/8
1 1/2	1.500	31.75	15	11
1 9/16	1.5625	34.40	15 1/4	11 1/4
1 5/8	1.625	37.70	15 5/8	11 5/8
1 11/16	1.6875	40.45	15 3/4	11 3/4
1 3/4	1.750	44.60	16 1/4	12 1/4
1 13/16	1.8125	47.45	16 1/4	12 1/4
1 7/8	1.875	51.75	16 1/2	12 1/2
1 15/16	1.9375	55.50	16 5/8	12 5/8
2	2.000	58.85	16 5/8	12 5/8

Always give List Number when ordering.
See pages 28 and 29 for Drills of special application.

HIGH SPEED

Straight Shank Jobbers'

List No. 110

Diam. Inches	Dec. Equiv.	List Price Per Doz.	Length Over All Inches	Length Flute Inches
1/64	.0156	$ 4.25	7/8	7/32
1/32	.0312	3.50	1 1/2	9/16
3/64	.0468	2.40	1 3/4	13/16
1/16	.0625	3.00	2 1/2	1 1/4
5/64	.0781	3.10	2 5/8	1 3/8
3/32	.0937	3.20	2 3/4	1 1/2
7/64	.1093	3.40	2 7/8	1 11/16
1/8	.125	3.60	3	1 13/16
9/64	.1406	3.90	3 1/8	1 15/16
5/32	.1562	4.20	3 1/4	2 3/32
11/64	.1718	4.50	3 3/8	2 7/32
3/16	.1875	4.85	3 1/2	2 5/16
13/64	.2031	5.25	3 5/8	2 7/16
7/32	.2187	5.75	3 3/4	2 17/32
15/64	.2343	6.25	3 7/8	2 21/32
1/4	.250	6.75	4	2 3/4
17/64	.2656	7.50	4 1/8	2 7/8
9/32	.2812	8.25	4 1/4	2 31/32
19/64	.2968	9.00	4 3/8	3 3/32
5/16	.3125	9.75	4 1/2	3 3/16
21/64	.3281	10.75	4 5/8	3 5/16
11/32	.3437	11.75	4 3/4	3 13/32
23/64	.3593	12.75	4 7/8	3 17/32
3/8	.375	13.75	5	3 5/8
25/64	.3906	15.00	5 1/8	3 3/4
13/32	.4062	16.25	5 1/4	3 27/32
27/64	.4218	17.50	5 3/8	3 31/32
7/16	.4375	18.75	5 1/2	4 1/16
29/64	.4531	20.00	5 5/8	4 3/16
15/32	.4687	21.25	5 3/4	4 9/32
31/64	.4843	22.75	5 7/8	4 13/32
1/2	.500	24.25	6	4 1/2

Always give List Number when ordering.
See pages 28 and 29 for Drills of special application.

HIGH SPEED

Straight Shank Letter Sizes

List No. 111

Letter Size	Dec. Equiv.	List Price Per Doz.	Length Over All Inches	Length Flute Inches
A	.234	$ 6.25	$3\frac{7}{8}$	$2\frac{5}{8}$
B	.238	6.55	$3\frac{7}{8}$	$2\frac{5}{8}$
C	.242	6.55	$3\frac{7}{8}$	$2\frac{5}{8}$
D	.246	6.75	4	$2\frac{3}{4}$
E	.250	6.75	4	$2\frac{3}{4}$
F	.257	7.50	$4\frac{1}{8}$	$2\frac{7}{8}$
G	.261	7.50	$4\frac{1}{8}$	$2\frac{7}{8}$
H	.266	8.00	$4\frac{1}{8}$	$2\frac{7}{8}$
I	.272	8.00	$4\frac{1}{8}$	$2\frac{7}{8}$
J	.277	8.00	$4\frac{1}{8}$	$2\frac{7}{8}$
K	.281	8.25	$4\frac{1}{4}$	3
L	.290	8.75	$4\frac{1}{4}$	3
M	.295	9.00	$4\frac{3}{8}$	$3\frac{1}{8}$
N	.302	9.50	$4\frac{3}{8}$	$3\frac{1}{8}$
O	.316	10.45	$4\frac{1}{2}$	$3\frac{1}{4}$
P	.323	10.75	$4\frac{5}{8}$	$3\frac{5}{16}$
Q	.332	11.75	$4\frac{3}{4}$	$3\frac{7}{16}$
R	.339	11.75	$4\frac{3}{4}$	$3\frac{7}{16}$
S	.348	12.75	$4\frac{7}{8}$	$3\frac{1}{2}$
T	.358	12.75	$4\frac{7}{8}$	$3\frac{1}{2}$
U	.368	13.75	5	$3\frac{5}{8}$
V	.377	14.65	5	$3\frac{5}{8}$
W	.386	15.00	$5\frac{1}{8}$	$3\frac{3}{4}$
X	.397	15.85	$5\frac{1}{8}$	$3\frac{3}{4}$
Y	.404	15.85	$5\frac{1}{4}$	$3\frac{7}{8}$
Z	.413	17.10	$5\frac{1}{4}$	$3\frac{7}{8}$

Always give List Number when ordering.
See pages 28 and 29 for Drills of special application.

HIGH SPEED
Straight Shank Wire Gauge
List No. 112

Wire Gauge Number	Dec. Equiv.	List Price Per Doz.	Length Over All Inches	Length Flute Inches
1	.228	$6.45	4	$2\frac{21}{32}$
2	.221	6.45	$3\frac{15}{16}$	$2\frac{5}{8}$
3	.213	6.15	$3\frac{15}{16}$	$2\frac{5}{8}$
4	.209	5.95	$3\frac{7}{8}$	$2\frac{19}{32}$
5	.2055	5.95	$3\frac{13}{16}$	$2\frac{9}{16}$
6	.204	5.95	$3\frac{13}{16}$	$2\frac{17}{32}$
7	.201	5.45	$3\frac{3}{4}$	$2\frac{1}{2}$
8	.199	5.45	$3\frac{11}{16}$	$2\frac{15}{32}$
9	.196	5.45	$3\frac{11}{16}$	$2\frac{7}{16}$
10	.1935	5.25	$3\frac{5}{8}$	$2\frac{3}{8}$
11	.191	5.25	$3\frac{9}{16}$	$2\frac{11}{32}$
12	.189	5.25	$3\frac{9}{16}$	$2\frac{5}{16}$
13	.185	4.85	$3\frac{1}{2}$	$2\frac{9}{32}$
14	.182	4.85	$3\frac{7}{16}$	$2\frac{1}{4}$
15	.180	4.85	$3\frac{7}{16}$	$2\frac{7}{32}$
16	.177	4.65	$3\frac{3}{8}$	$2\frac{3}{16}$
17	.173	4.65	$3\frac{5}{16}$	$2\frac{5}{32}$
18	.1695	4.50	$3\frac{5}{16}$	$2\frac{1}{8}$
19	.166	4.35	$3\frac{1}{4}$	$2\frac{3}{32}$
20	.161	4.35	$3\frac{3}{16}$	$2\frac{1}{16}$
21	.159	4.35	$3\frac{3}{16}$	$2\frac{1}{16}$
22	.157	4.15	$3\frac{1}{8}$	2
23	.154	4.05	$3\frac{1}{16}$	$1\frac{31}{32}$
24	.152	4.05	$3\frac{1}{16}$	$1\frac{15}{16}$
25	.1495	3.90	3	$1\frac{29}{32}$
26	.147	3.90	$2\frac{15}{16}$	$1\frac{7}{8}$
27	.144	3.90	$2\frac{15}{16}$	$1\frac{27}{32}$
28	.1405	3.60	$2\frac{7}{8}$	$1\frac{13}{16}$
29	.136	3.60	$2\frac{13}{16}$	$1\frac{3}{4}$
30	.1285	3.60	$2\frac{13}{16}$	$1\frac{23}{32}$
31	.120	3.30	$2\frac{3}{4}$	$1\frac{11}{16}$
32	.116	3.30	$2\frac{11}{16}$	$1\frac{5}{8}$
33	.113	3.30	$2\frac{11}{16}$	$1\frac{5}{8}$
34	.111	3.15	$2\frac{5}{8}$	$1\frac{9}{16}$
35	.110	3.15	$2\frac{9}{16}$	$1\frac{1}{2}$
36	.1065	3.10	$2\frac{9}{16}$	$1\frac{1}{2}$
37	.104	2.95	$2\frac{1}{2}$	$1\frac{7}{16}$
38	.1015	2.95	$2\frac{7}{16}$	$1\frac{3}{8}$

Always give List Number when ordering.
See pages 28 and 29 for Drills of special application.

HIGH SPEED. Straight Shank Wire Gauge

List No. 112

Wire Gauge Number	Dec. Equiv.	List Price Per Doz.	Length Over All Inches	Length Flute Inches
39	.0995	$2.95	2 7/16	1 11/32
40	.098	2.80	2 3/8	1 11/32
41	.096	2.80	2 5/16	1 5/16
42	.0935	2.75	2 5/16	1 1/4
43	.089	2.60	2 1/4	1 7/32
44	.086	2.60	2 3/16	1 3/16
45	.082	2.60	2 3/16	1 1/8
46	.081	2.50	2 1/8	1 1/8
47	.0785	2.50	2 1/16	1 3/32
48	.076	2.50	2 1/16	1 1/16
49	.073	2.50	2	1
50	.070	2.40	1 15/16	31/32
51	.067	2.40	1 15/16	15/16
52	.0635	2.40	1 7/8	7/8
53	.0595	2.40	1 13/16	27/32
54	.055	2.40	1 13/16	27/32
55	.052	2.40	1 3/4	13/16
56	.0465	2.40	1 11/16	25/32
57	.043	2.40	1 11/16	23/32
58	.042	2.40	1 5/8	23/32
59	.041	2.40	1 9/16	11/16
60	.040	2.40	1 9/16	11/16
61	.039	3.50	1 1/2	5/8
62	.038	3.50	1 1/2	5/8
63	.037	3.50	1 1/2	5/8
64	.036	3.50	1 1/2	9/16
65	.035	3.50	1 1/2	9/16
66	.033	3.50	1 1/2	9/16
67	.032	3.50	1 7/16	9/16
68	.031	3.50	1 7/16	1/2
69	.0292	3.50	1 3/8	1/2
70	.028	3.50	1 5/16	7/16
71	.026	4.25	1 5/16	7/16
72	.025	4.25	1 1/4	3/8
73	.024	4.25	1 3/16	5/16
74	.0225	4.25	1 1/8	5/16
75	.021	4.25	1 1/16	1/4
76	.020	4.25	1	1/4
77	.018	4.25	15/16	7/32
78	.016	4.25	7/8	7/32
79	.0145	4.25	13/16	3/16
80	.0135	4.25	3/4	3/16

Always give List Number when ordering.
See pages 28 and 29 for Drills of special application.

AMERICAN STANDARD DRILLS

Made in all sizes

List Nos. 101 to 112

Prices listed on pages 6 to 27 inclusive

AMERICAN "A" DRILLS

Made in all sizes

List Nos. 101 to 105 and 110 to 112

Prices listed on pages 6 to 15 and 24 to 27 inclusive

AMERICAN "B" DRILLS

Made only in sizes listed on pages 24, 25, 26 and 27

List Nos. 110, 111, and 112

Prices listed on pages 24, 25, 26 and 27

AMERICAN "C" DRILLS

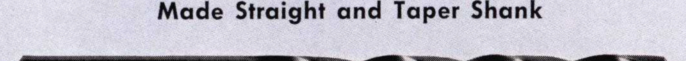
Made only in sizes from No. 60 to ¼ inch

List Nos. 110 and 112

Prices listed on pages 24, 26 and 27

AMERICAN "D" DRILLS

Made Straight and Taper Shank



List Nos. 101 and 110

Prices listed on pages 6, 7, 8 and 24

AMERICAN STANDARD TYPE . . . Available from stock in fractional, wire, and letter sizes, straight and Taper Shank. These are suited to high production purposes in cast iron, steel, steel forgings, bar stock, etc. *Please specify List Number when ordering.*

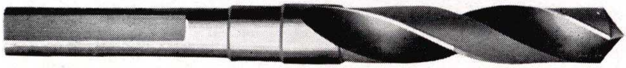
AMERICAN “A”—ALUMINUM & MAGNESIUM . . . For use in drilling Aluminum, Magnesium, Die-Cast Metal, Copper, Slate, and Marble. The fast spiral and wide polished flutes afford free cutting action and easy chip disposal. *Please specify List Number followed by suffix "A" when ordering this type of drill.*

AMERICAN “B”—BRASS, BAKELITE, FIBRE . . . The slow spiral and highly polished flutes are adapted for use in the above materials as well as other plastics and wood. *Please specify List Number followed by suffix "B" when ordering this type of drill.*

AMERICAN “C”—COTTER PIN . . . This drill is of heavy construction and fast spiral affording great strength and shear cutting action for tough materials. As the name implies it is for drilling pin holes in shafts, axles, etc. *Please specify List Number followed by suffix "C" when ordering this type of drill.*

AMERICAN “D”—DOUBLE DUTY, HEAVY DUTY . . . A design created and heat-treated for use in deep drilling of the tougher materials. Incorporating heavier webs and fast spirals they will withstand greater speeds and feeds as well as added torque strain. *Please specify List Number followed by suffix "D" when ordering this type of drill.*

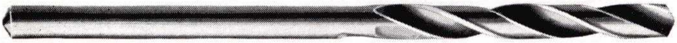
This drill in special length is particularly suited to drilling crankshafts and connecting rods. See illustration on page 50.



BONDING DRILLS

List No. 113

Diameter Inches	Shank Diameter Inches	List Price Per Doz.	Length Over All Inches	Length Flute Inches
9/32	9/32	$ 7.00	3	1 3/4
3/8	9/32	11.00	3	1 3/4
3/8	3/8	11.00	3	1 3/4



TELL TALE DRILLS

Short Lengths

List No. 114

Diameter Inches	List Price Per Doz.	Length Over All Inches	Length Flute Inches
3/16	$4.85	3 1/2	1 3/4
7/32	5.75	3 3/4	1 3/4

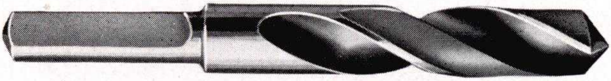
TELL TALE DRILLS

Long Lengths

List No. 115

Diameter Inches	List Price Each	Length Over All Inches	Length Flute Inches
3/16	$1.25	5 1/2	3 1/2
7/32	1.35	5 1/2	3 1/2

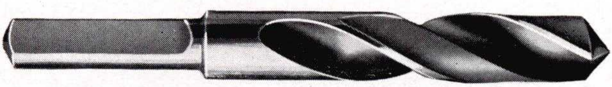
SILVER AND DEMING DRILLS—1/2″ SHANKS



Short Lengths—Fitting Blacksmiths' Drill Presses
High Speed Steel
List No. 116

Size of Shank, 1/2″ Diameter and 2 1/4″ long

COE'S DRILLS—5/8″ SHANKS



Fitting Blacksmiths' Drill Presses
High Speed Steel
List No. 117

Size of Shank, about 5/8″ (.647 exact) Diameter and 2 1/4″ Long

Diam. Inches	List Price Each		Length Over All Inches	Diam. Inches	List Price Each		Length Over All Inches
	Silver and Deming	Coes			Silver and Deming	Coes	
1/8	$1.40	....	4 7/8	21/32	$4.75	$ 4.75	6
5/32	1.50	....	5 1/8	11/16	5.00	5.00	6
3/16	1.60	....	5 1/2	23/32	5.25	5.25	6
7/32	1.75	....	5 3/4	3/4	5.50	5.50	6
1/4	1.90	....	6	25/32	5.75	5.75	6
9/32	2.05	....	6	13/16	6.00	6.00	6
5/16	2.20	....	6	27/32	6.25	6.25	6
11/32	2.35	....	6	7/8	6.50	6.50	6
3/8	2.50	....	6	29/32	6.75	6.75	6
13/32	2.75	....	6	15/16	7.25	7.25	6
7/16	3.00	....	6	31/32	7.75	7.75	6
15/32	3.25	....	6	1	8.50	8.50	6
1/2	3.50	$3.50	6	1 1/32	....	9.25	6
17/32	3.75	3.75	6	1 1/16	....	10.00	6
9/16	4.00	4.00	6	1 1/8	....	11.25	6
19/32	4.25	4.25	6	1 3/16	....	12.50	6
5/8	4.50	4.50	6	1 1/4	....	13.75	6

Always give List Number when ordering.

FILE YOUR DRILLS IN A DRILL INDEX

A DRILL STAND AND INDEXED
CONTAINER WITH TAP INFORMATION
AND DECIMAL EQUIVALENTS

for

Tool and Die Makers, Machinists, Electricians, Cabinet Makers, Garage Mechanics, Manual Training Schools, Vocational Schools, Aviators, *and in fact anyone who uses small drills.*

•

Takes up very little room in tool kit and is a wonderful help for the man called to do a job away from the shop.

The list No. 120 Index holding 60 drills is so compact that it can be carried in the vest pocket.

•

THE MOST USABLE AND EFFICIENT DRILL FILING SYSTEM OBTAINABLE

Like a card index, a place for each drill marked with size and decimal equivalent.

Eliminates the endless search for the right size drill.

Just a flip of the wrist and the case is open so you can quickly and easily pick your drill.

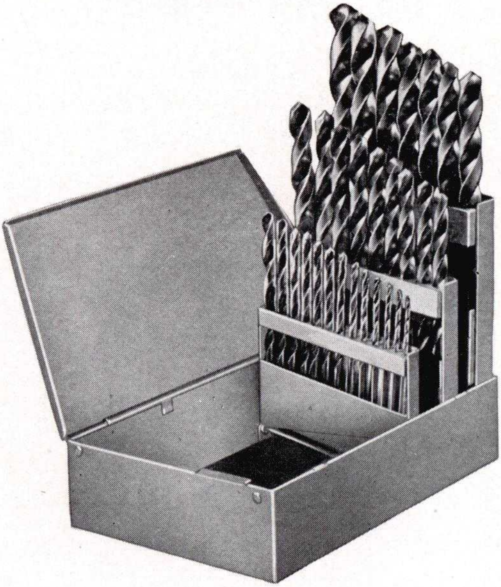
Ideal for the mechanics who use hand, electric, breast and portable drills.

Convenient and orderly way of keeping drills in tool kit or work bench drawer.

The index makes a useful and attractive addition to the tool kit.

All users of small drills will want one of these indexes, it pays for itself in a short time.

THE HUOT DRILL INDEX IS MADE IN FOUR SIZES



No. 118—For jobbers' or fractional drills 1/16 in. to 1/4 in. inclusive by 64ths.

List Price of Index only	**$1.50**
List Price of Drills only	**$4.85**

Size 2 1/16 in. wide, 4 5/8 in. long, 5/8 in. deep.

No. 119—For jobbers' or fractional drills 1/16 in. to 1/2 in. inclusive by 64ths. Decimal equivalents, U.S.S. and S.A.E. tap information.

List Price of Index only	**$4.50**
List Price of Drills only	**$24.75**

Size 4 in. wide, 7 in. long, 1 3/4 in. deep.

No. 120—For wire gauge sizes 1 to 60 inclusive, decimal equivalents, machine screw tap information.

List Price of Index only	**$3.75**
List Price of Drills only	**$18.85**

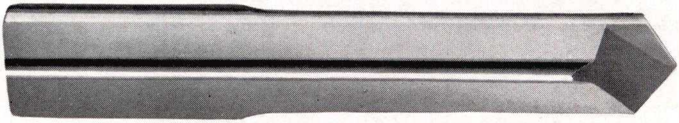
Size 3 1/4 in. wide, 4 1/2 in. long, 1 in. deep.

No. 121—For straight-shank drills, letter sizes A to Z.

List Price of Index only	**$4.00**
List Price of Drills only	**$22.50**

Size 4 1/16 in. wide, 7 in. long, 1 11/16 in. deep.

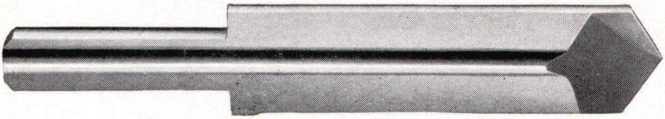
HIGH SPEED TRACK BITS



Flat Beaded
List No. 122

Fitting Flat Drill Chucks on Paulus, New Style Paulus, Moore, Buda, Girder, Calumet Improved Heavy Duty, Buda "Hyduty" Paulus, Richtal, and heavy track drilling machines.

Bits 13/16 and smaller, 1/4 inch thick; 7/8 and larger, 5/16 inch thick.
Bits 9/16 and smaller, No. 1 bead; 5/8 and larger, No. 2 bead.



Combination Flat Beaded with Round Shank
List No. 123

Fitting Flat Drill Chucks on Paulus, New Style Paulus, Moore, Buda, Girder, Calumet Improved Heavy Duty, Buda "Hyduty" Paulus, Richtal, and heavy track drilling machines.

Bits 13/16 and smaller, 1/4 inch thick; 7/8 and larger, 5/16 inch thick.
Bits 9/16 and smaller, No. 1 bead; 5/8 and larger, No. 2 bead.

Prices and Specifications for List Numbers 122 and 123

Diam. Inches	List Price Each	Length Over All Inches	Diam. Inches	List Price Each	Length Over All Inches
1/2	$2.00	6 1/4	1 1/16	$3.30	6 1/4
9/16	2.10	6 1/4	1 1/8	3.50	6 1/4
5/8	2.20	6 1/4	1 3/16	3.70	6 1/4
11/16	2.30	6 1/4	1 1/4	3.90	6 1/4
3/4	2.40	6 1/4	1 5/16	4.40	6 1/4
13/16	2.60	6 1/4	1 3/8	4.80	6 1/4
7/8	2.80	6 1/4	1 7/16	5.60	6 1/4
15/16	3.00	6 1/4	1 1/2	6.20	6 1/4
1	3.10	6 1/4			

Always give List Number when ordering.

TWIST DRILLS
Metric Sizes
HIGH SPEED STEEL
With Regular Taper Shank
List No. 124

Diam. Millimeters	Dec. Equiv.	List Price Each	No. of Taper Shank	Length Over All Millimeters
3	.1181	$1.00	1	130
3.5	.1378	1.10	1	136
4	.1574	1.15	1	136
4.5	.1771	1.25	1	146
5	.1968	1.35	1	152
5.5	.2165	1.35	1	152
6	.2362	1.40	1	155
6.5	.2559	1.45	1	155
7	.2755	1.50	1	159
7.5	.2952	1.60	1	162
8	.3149	1.70	1	162
8.5	.3346	1.70	1	165
9	.3543	1.90	1	171
9.5	.3740	1.90	1	171
10	.3937	2.10	1	178
10.5	.4134	2.30	1	184
11	.4330	2.30	1	184
11.5	.4527	2.50	1	190
12	.4724	2.70	1	190
12.5	.4921	2.95	2	210
13	.5118	3.25	2	216
13.5	.5315	3.65	2	216
14	.5511	3.75	2	222
14.5	.5708	4.00	2	222
15	.5905	4.00	2	222
15.5	.6102	4.25	2	222
16	.6299	4.60	2	222
16.5	.6496	4.75	2	229
17	.6692	5.25	2	235
17.5	.6890	5.75	2	235
18	.7086	5.75	2	241
18.5	.7283	6.25	2	248
19	.7480	6.25	2	248
19.5	.7677	6.50	2	251
20	.7874	7.25	3	273
20.5	.8071	7.25	3	273
21	.8267	7.65	3	273
21.5	.8464	8.05	3	273

Always give List Number when ordering.

High Speed Quality Drills

TWIST DRILLS. Metric Sizes. HIGH SPEED STEEL
With Regular Taper Shank
List No. 124

Diam. Millimeters	Dec. Equiv.	List Price Each	No. of Taper Shank	Length Over All Millimeters
22	.8661	$ 8.05	3	273
22.5	.8858	8.45	3	273
23	.9055	8.45	3	273
23.5	.9252	8.85	3	273
24	.9448	9.65	3	279
24.5	.9646	9.65	3	279
25	.9842	10.25	3	279
25.5	1.0039	11.00	3	279
26	1.0236	11.00	3	283
26.5	1.0433	11.75	3	286
27	1.0629	12.20	3	286
27.5	1.0827	13.25	4	317
28	1.1024	14.25	4	324
28.5	1.1220	14.25	4	324
29	1.1417	15.00	4	327
29.5	1.1614	15.75	4	330
30	1.1811	15.75	4	330
30.5	1.2008	16.50	4	333
31	1.2205	18.00	4	333
31.5	1.2401	18.00	4	343
32	1.2598	20.00	4	359
32.5	1.2795	20.00	4	359
33	1.2992	20.75	4	362
33.5	1.3188	21.50	4	365
34	1.3386	21.50	4	365
34.5	1.3583	22.25	4	368
35	1.3779	23.00	4	368
35.5	1.3977	23.00	4	372
36	1.4173	23.75	4	375
36.5	1.4370	23.75	4	375
37	1.4567	24.50	4	378
37.5	1.4764	25.25	4	381
38	1.4961	25.25	4	381
38.5	1.5157	28.75	5	416
39	1.5354	30.75	5	422
39.5	1.5551	30.75	5	422
40	1.5748	32.75	5	428
40.5	1.5945	34.00	5	428

Always give List Number when ordering.

TWIST DRILLS. Metric Sizes. HIGH SPEED STEEL

With Regular Taper Shank

List No. 124

Diam. Millimeters	Decimal Equivalent	List Price Each	No. of Taper Shank	Length Over All Millimeters
41	1.6142	$ 34.00	5	431
41.5	1.6338	35.25	5	435
42	1.6536	35.25	5	435
42.5	1.6732	36.50	5	435
43	1.6929	37.75	5	435
43.5	1.7126	37.75	5	435
44	1.7323	39.00	5	435
44.5	1.7519	40.25	5	435
45	1.7717	40.25	5	435
46	1.8110	41.50	5	435
47	1.8504	45.00	5	441
48	1.8898	46.25	5	441
49	1.9291	47.50	5	441
50	1.9685	48.75	5	441
51	2.0079	51.75	5	441
52	2.0473	53.50	5	441
53	2.0866	55.25	5	441
54	2.1259	58.75	5	441
55	2.1654	60.50	5	441
56	2.2047	62.25	5	441
57	2.2441	64.00	5	441
58	2.2835	67.50	5	441
59	2.3228	71.00	5	441
60	2.3622	71.00	5	441
61	2.4015	87.50	5	476
62	2.4409	91.00	5	476
63	2.4803	91.00	5	476
64	2.5197	100.00	5	495
65	2.5590	100.00	5	495
66	2.5984	105.00	5	495
67	2.6378	110.55	5	495
68	2.6772	115.50	5	517
69	2.7165	120.50	5	517
70	2.7559	125.65	5	517
71	2.7952	129.50	5	537
72	2.8346	135.00	5	537
73	2.8740	135.00	5	537
74	2.9134	142.50	5	552
75	2.9527	150.00	5	552
76	2.9921	150.00	5	552

Always give List Number when ordering.

TWIST DRILLS. Metric Sizes. HIGH SPEED STEEL

Taper Shanks Smaller than Regular

List No. 125

Diam. Milli-meters	Decimal Equivalent	List Price Each	No. of Taper Shank	Length Over All Millimeters
12.5	.4921	$ 2.75	1	197
13	.5118	3.05	1	203
13.5	.5315	3.40	1	203
14	.5511	3.50	1	210
20	.7874	6.75	2	254
20.5	.8071	6.75	2	254
21	.8267	7.15	2	254
21.5	.8464	7.50	2	254
22	.8661	7.50	2	254
22.5	.8858	7.85	2	254
23	.9055	7.85	2	254
27.5	1.0827	12.20	3	292
28	1.1024	13.15	3	298
28.5	1.1220	13.15	3	298
29	1.1417	13.85	3	301
29.5	1.1614	14.55	3	301
30	1.1811	14.55	3	305
30.5	1.2008	15.25	3	308
31	1.2205	16.65	3	308
31.5	1.2401	16.65	3	317
38.5	1.5157	26.35	4	381
39	1.5354	28.20	4	381
39.5	1.5551	28.20	4	387
40	1.5748	30.10	4	394
40.5	1.5945	31.25	4	394
41	1.6142	31.25	4	397
41.5	1.6338	32.40	4	400
42	1.6536	32.40	4	400
42.5	1.6732	33.55	4	400
43	1.6929	34.70	4	400
43.5	1.7126	34.70	4	400
44	1.7323	37.00	4	413
44.5	1.7519	38.20	4	413
45	1.7717	38.20	4	413
46	1.8110	39.40	4	413
47	1.8504	42.75	4	419
48	1.8898	43.95	4	419
49	1.9291	45.45	4	422
50	1.9685	46.65	4	422

Always give List Number when ordering.

TWIST DRILLS. Metric Sizes. HIGH SPEED STEEL

Straight Shank Taper Length

List No. 126

Diameter Milli-meters	Decimal Equivalent	List Price Each	Length Over All Millimeters
3	.1181	$1.00	130
3.5	.1378	1.10	136
4	.1574	1.15	136
4.5	.1771	1.25	146
5	.1968	1.35	152
5.5	.2165	1.35	152
6	.2362	1.40	155
6.5	.2559	1.45	155
7	.2755	1.50	159
7.5	.2952	1.60	162
8	.3149	1.70	162
8.5	.3346	1.70	165
9	.3543	1.90	171
9.5	.3740	1.90	171
10	.3937	2.10	178
10.5	.4134	2.30	184
11	.4330	2.30	184
11.5	.4527	2.50	190
12	.4724	2.70	190
12.5	.4921	2.75	197
13	.5118	3.05	203
13.5	.5315	3.40	203
14	.5511	3.50	210
14.5	.5708	4.00	222
15	.5905	4.00	222
15.5	.6102	4.25	222
16	.6299	4.60	222
16.5	.6496	4.75	229
17	.6692	5.25	235
17.5	.6890	5.75	235
18	.7086	5.75	241
18.5	.7283	6.25	248
19	.7480	6.25	248
19.5	.7677	6.50	251
20	.7874	6.75	254
20.5	.8071	6.75	254
21	.8267	7.15	254
21.5	.8464	7.50	254

Always give List **Number** when ordering.

TWIST DRILLS. Metric Sizes. HIGH SPEED STEEL

Straight Shank Taper Length

List No. 126

Diameter Millimeters	Decimal Equivalent	List Price Each	Length Over All Millimeters
22	.8661	$ 7.50	254
22.5	.8858	7.85	254
23	.9055	7.85	254
23.5	.9252	8.85	273
24	.9448	9.65	279
24.5	.9646	9.65	279
25	.9842	10.25	279
25.5	1.0039	11.00	279
26	1.0236	11.00	283
26.5	1.0433	11.75	286
27	1.0629	12.20	286
27.5	1.0827	12.20	292
28	1.1024	13.15	298
28.5	1.1220	13.15	298
29	1.1417	13.85	301
29.5	1.1614	14.55	301
30	1.1811	14.55	305
31	1.2205	16.65	308
32	1.2598	20.00	359
33	1.2992	20.75	362
34	1.3386	21.50	365
35	1.3779	23.00	368
36	1.4173	23.75	375
37	1.4567	24.50	378
38	1.4961	25.25	381
39	1.5354	28.20	381
40	1.5748	30.10	394
41	1.6142	31.25	397
42	1.6536	32.40	400
43	1.6929	34.70	400
44	1.7323	37.00	413
45	1.7717	38.20	413
46	1.8110	39.40	413
47	1.8504	42.75	419
48	1.8898	43.95	419
49	1.9291	45.45	422
50	1.9685	46.65	422

Always give List Number when ordering.

TWIST DRILLS. Metric Sizes. HIGH SPEED STEEL
Straight Shank Wire and Jobbers' Lengths
List No. 127

Diameter Millimeters	Decimal Equivalent	List Price Per Dozen	Length Over All Millimeters
.35	.0138	$4.25	19
.40	.0158	4.25	22
.45	.0177	4.25	24
.50	.0197	4.25	25
.55	.0217	4.25	27
.60	.0236	4.25	30
.65	.0256	4.25	32
.70	.0276	3.50	33
.75	.0295	3.50	35
.80	.0315	3.50	37
.85	.0335	3.50	38
.90	.0354	3.50	38
.95	.0374	3.50	38
1.00	.0394	3.50	38
1.05	.0413	2.40	40
1.10	.0433	2.40	43
1.15	.0453	2.40	43
1.20	.0472	2.40	43
1.25	.0492	2.40	43
1.30	.0512	2.40	44
1.35	.0531	2.40	44
1.40	.0551	2.40	46
1.45	.0571	2.40	46
1.50	.0591	2.40	46
1.55	.0610	2.40	46
1.60	.0630	2.40	48
1.65	.0650	2.40	48
1.70	.0669	2.40	49
1.75	.0689	2.40	49
1.80	.0709	2.40	49
1.85	.0728	2.50	51
1.90	.0748	2.50	52
1.95	.0768	2.50	52
2.00	.0787	2.50	52
2.05	.0807	2.50	54

Always give List Number when ordering.

High Speed Quality Drills

TWIST DRILLS. Metric Sizes. HIGH SPEED STEEL
Straight Shank Wire and Jobbers' Lengths
List No. 127

Diameter Millimeters	Decimal Equivalent	List Price Per Dozen	Length Over All Millimeters
2.10	.0827	$2.60	56
2.15	.0846	2.60	56
2.20	.0866	2.60	56
2.25	.0886	2.60	57
2.30	.0906	2.60	57
2.35	.0925	2.75	59
2.40	.0945	2.80	59
2.45	.0965	2.80	59
2.50	.0984	2.80	60
2.60	.1024	2.95	62
2.70	.1063	3.10	65
2.75	.1083	3.10	65
2.80	.1102	3.15	65
2.90	.1142	3.30	68
3.00	.1181	3.30	70
3.10	.1220	3.30	70
3.20	.1260	3.60	71
3.25	.1279	3.60	71
3.30	.1299	3.60	71
3.40	.1339	3.60	71
3.50	.1378	3.60	71
3.60	.1417	3.60	73
3.70	.1457	3.90	75
3.75	.1476	3.90	75
3.80	.1496	3.90	76
3.90	.1535	4.05	78
4.00	.1575	4.15	79
4.10	.1614	4.35	81
4.20	.1654	4.35	83
4.25	.1673	4.35	83
4.30	.1693	4.50	84
4.40	.1732	4.65	84
4.50	.1772	4.85	86
4.60	.1811	4.85	87
4.70	.1850	4.85	89

Always give List Number when ordering.

High Speed Quality Drills

TWIST DRILLS. Metric Sizes. HIGH SPEED STEEL
Straight Shank Wire and Jobbers' Lengths
List No. 127

Diameter Millimeters	Decimal Equivalent	List Price Per Dozen	Length Over All Millimeters
4.75	.1870	$4.85	89
4.80	.1890	5.25	90
4.90	.1929	5.25	92
5.00	.1969	5.45	94
5.10	.2008	5.45	95
5.20	.2047	5.95	97
5.25	.2067	5.95	97
5.30	.2087	5.95	98
5.40	.2126	5.95	98
5.50	.2165	5.95	98
5.60	.2205	6.25	98
5.70	.2244	6.25	98
5.75	.2264	6.25	98
5.80	.2283	6.25	98
5.90	.2323	6.25	98
6.00	.2362	6.55	98
6.10	.2402	6.55	98
6.20	.2441	6.75	102
6.25	.2461	6.75	102
6.30	.2480	6.75	102
6.40	.2520	7.25	102
6.50	.2559	7.50	105
6.60	.2598	7.50	105
6.70	.2638	7.50	105
6.75	.2657	7.50	105
6.80	.2677	8.00	105
6.90	.2717	8.00	105
7.00	.2756	8.00	105
7.10	.2795	8.25	108
7.20	.2835	8.75	108
7.25	.2854	8.75	108
7.30	.2874	8.75	108
7.40	.2913	8.75	108
7.50	.2953	9.00	111
7.60	.2992	9.50	111

Always give List Number when ordering.

TWIST DRILLS. Metric Sizes. HIGH SPEED STEEL
Straight Shank Wire and Jobbers' Lengths
List No. 127

Diameter Millimeters	Decimal Equivalent	List Price Per Dozen	Length Over All Millimeters
7.70	.3031	$ 9.50	111
7.75	.3051	9.50	111
7.80	.3071	9.50	111
7.90	.3110	9.75	114
8.00	.3150	10.45	114
8.10	.3189	10.45	114
8.20	.3228	10.75	117
8.25	.3248	10.75	117
8.30	.3268	10.75	117
8.40	.3307	11.75	121
8.50	.3346	11.75	121
8.60	.3386	11.75	121
8.70	.3425	11.75	121
8.75	.3445	11.75	121
8.80	.3465	12.75	124
8.90	.3504	12.75	124
9.00	.3543	12.75	124
9.10	.3583	12.75	124
9.20	.3622	13.40	124
9.25	.3642	13.75	127
9.30	.3661	13.75	127
9.40	.3701	13.75	127
9.50	.3740	13.75	127
9.60	.3780	14.65	127
9.70	.3819	15.00	130
9.75	.3839	15.00	130
9.80	.3858	15.00	130
9.90	.3898	15.00	130
10.00	.3937	15.85	130
10.50	.4134	17.10	133
11.00	.4331	18.75	140
11.50	.4528	20.00	143
12.00	.4724	22.25	146
12.50	.4921	24.25	150
13.00	.5118	26.50	152

Always give List Number when ordering.

SUGGESTIONS FOR ORDERING SPECIAL DRILLS

Our staff of competent drill engineers is available at any time. They are men of wide experience, qualified to help you analyze your drilling problems, and select the equipment best fitted to your particular work. Enlist their cooperation the next time you have a drilling problem.

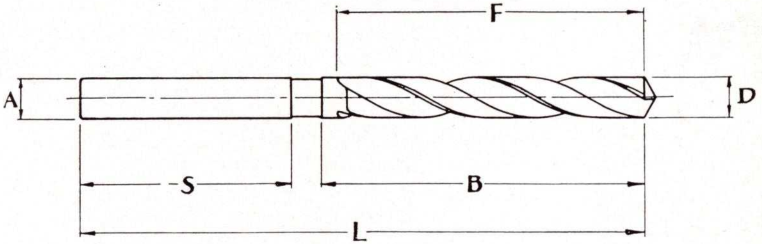
The fullest benefits of our previous experience on similar operations will be gained by our customers if the following information is supplied:

Type of material to be drilled, its hardness, rough or machined surface to be penetrated, blind or through hole, depth of hole.

Type of machine, type of feed, vertical or horizontal, with or without coolant.

Tolerance to be maintained.

STRAIGHT SHANK DRILLS

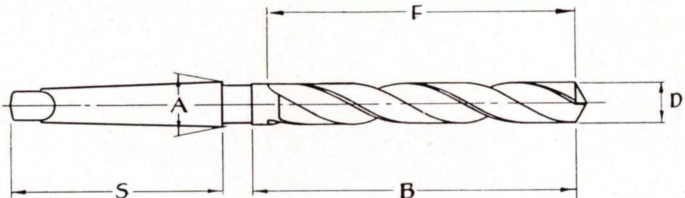


A. Diameter of Straight Shank (with tolerances).

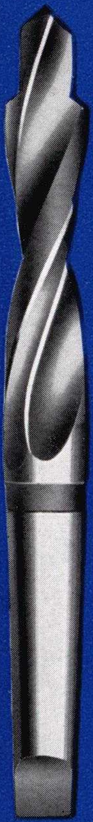
D. Diameter of fluted section (with tolerances). Use decimals instead of fractions for odd sizes.

L. Length Over-all.
F. Length of Flute.
S. Length of Shank.
B. Length of Barrel.

A. ⎰Size of Taper Shank. If standard shank is ordered, specify as No. 2.
S. ⎱Morse, No. 3 Morse, etc.



TAPER SHANK DRILLS



MULTI-CUT or SUB-LAND DRILLS

The Multi-Cut drill is an improved development of the ordinary step drill. Its purpose is to combine such operations as drill and countersink, counterbore, chamfer, ream, or step-drill in multiple diameters as shown in illustration below.

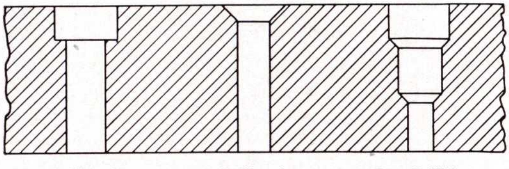
Multi-Cut drills may be made with two or more diameters depending on size and variations of size required. It is not advisable to employ too great a variation in sizes due to resultant differential in speeds and feeds.

Two or more diameters are maintained throughout the fluted section, requiring only a touch-up grind at the lip of each diameter. This affords longer life over the step-drill by eliminating the necessity for cutting off the pilot portion in the course of regrinding.

Our capacity for the manufacture of this type of tool is limited to sizes employing .200 and over on the small diameter.

It is advisable to provide a drawing of these tools showing all details, length, diameters, angles, radii, etc.

Prices on Application



SPECIAL COMBINATION DRILLS

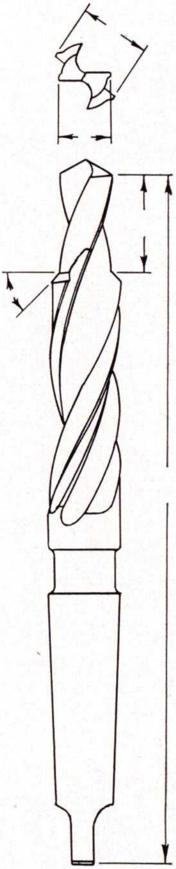


Fig. 1

The Multi-Cut drill is designed to drill and countersink, drill and counterbore, or drill holes of two or more diameters. More than two diameters may be incorporated if size and variation of sizes permit.

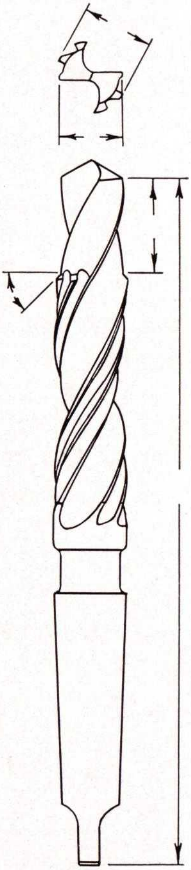


Fig. 2

The Multi-Cut type Combined Drill and Reamer is designed to perform drilling and reaming operations in one pass. The drilling and reaming diameters are maintained throughout the fluted section as in the Multi-Cut Drill.

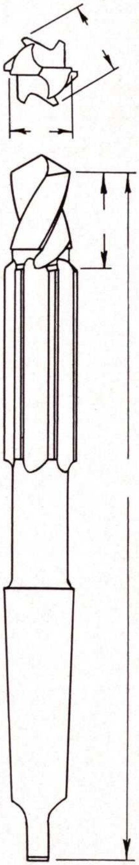
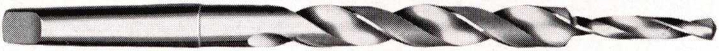


Fig. 3

This type Combination Drill and Reamer is designed to perform the combined operations where a higher degree of precision is required. The life of the tool is limited to that of the drill portion.

SPECIAL DRILLS



Step Drills—Step drills are employed for drilling holes of two or more diameters, and for drilling and chamfering, countersinking, or counterboring.

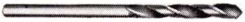
The step diameters are ground on standard fluted drills and may be applied on operations drilling in solid stock or on core drills for pierced or cored holes.

The large diameter may be cleared for counterboring or left uncleared for countersinking or chamfering. Drills left uncleared may have some advantage in affording a better bearing in bushings or better gripping surface in collets.

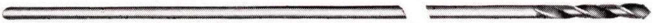
The relatively low initial cost of this type of tool may in some cases be overshadowed by the advantages to be found in the use of the Multi-Cut Type. See Figure 1, Page 47.

Prices on Application

SPECIAL DRILLS



Body or Skin Drills—For auto body, airplane wing and fuselage as well as other forms of sheet metal drilling. The shorter over-all and flute length reduces breakage substantially, while providing all that is required to penetrate the usual wall thickness. For use in portable drilling equipment, this sturdy drill will withstand far more abuse than drills of standard length.



Extension Drills with short flute lengths are made with spring tempered shanks for use in drilling airplane wing sections. They will therefore withstand the distortion to which they are subjected in reaching into otherwise inaccessible corners.

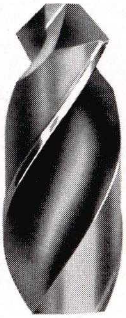
Prices on Application

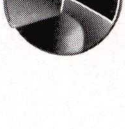
SPECIAL DRILLS

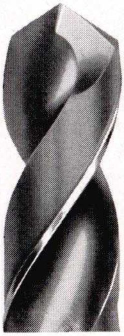
Crankshaft Drills—The crankshaft type drill is generally of extra length having a fast spiral, heavy web section, and a special point as illustrated below. The extra web thickness usually permits giving drills an extra point or two in Rockwell Hardness. This construction and added hardness are particularly suited to drilling of oil holes in crankshafts, connecting rods, and other deep holes in tough materials.

The special point shown below provides a cutting edge to the center of a drill. In materials having exceedingly hard surfaces or being hard throughout, this type of point permits easier penetration. It does not lend itself to a great degree of accuracy in size or alignment however. Generally, greater allowances must be made where reamed surfaces are required in ensuing operations.

Prices on Application
per your blueprint or specifications.

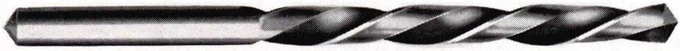






SPECIAL DRILLS

Left Hand Drills—Dimensions are same as those of regular Right Hand Drills. Made in straight and Taper Shank ¼″ and over.



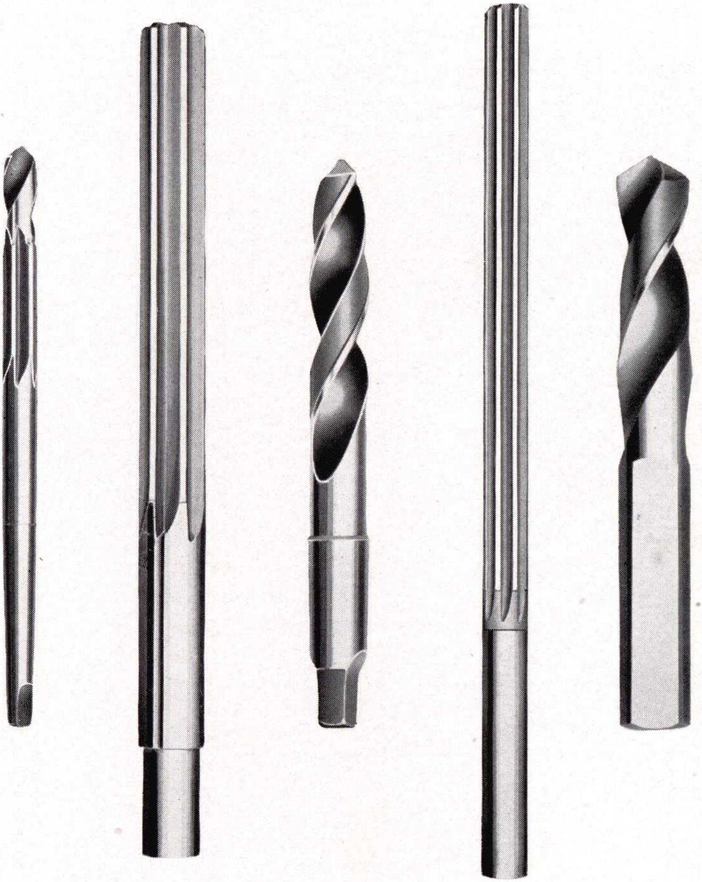
Prices on Application

Straight Flute Drills—Dimensions same as those of Regular Right Hand Drills. Made in straight and Taper Shank ¼″ and over.

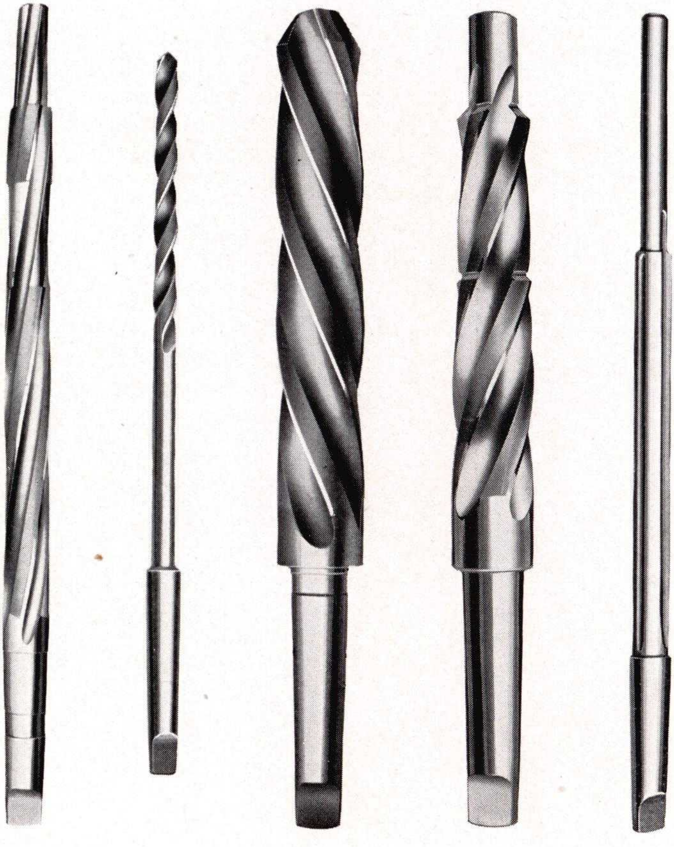
Prices on Application

SPECIAL DRILLS

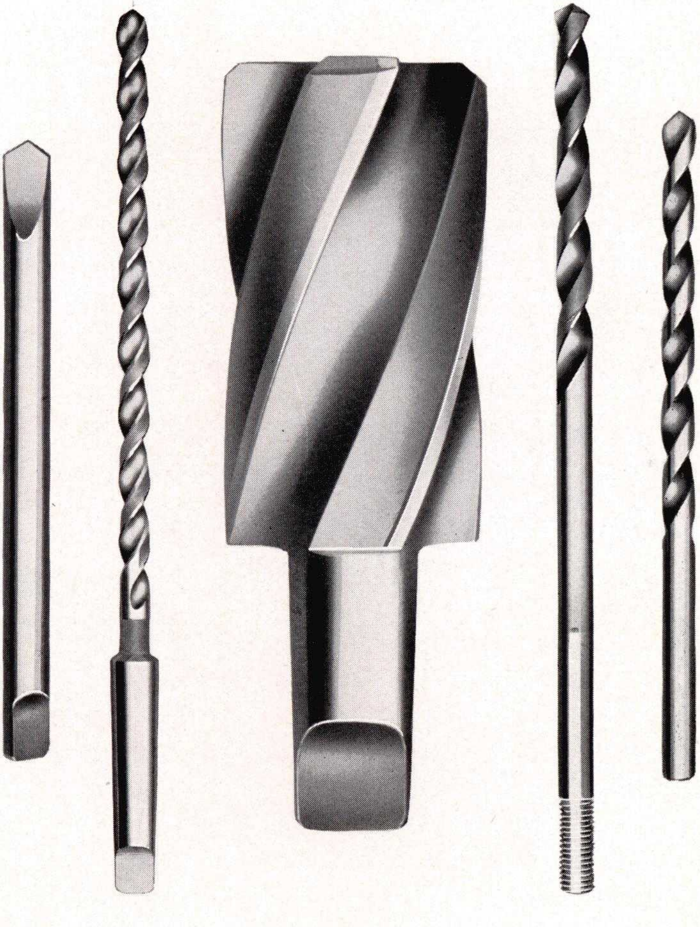
SPECIAL DRILLS



SPECIAL DRILLS

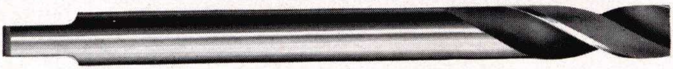


SPECIAL DRILLS



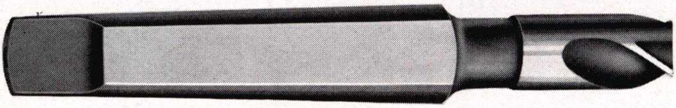
SHANK FEATURES

Straight Shank Drills are sometimes flatted for use in various makes of sleeves. May be applied to standard drills from stock or drills made to specifications.



Prices on Application

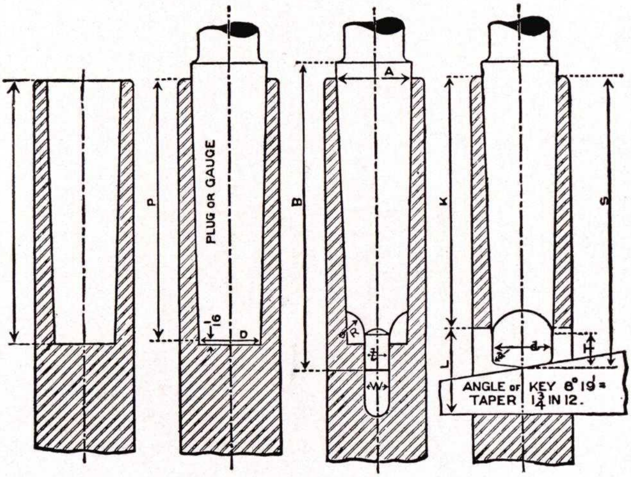
Tapered Shank Drills may be flatted for Use-Em-Up Sleeve either from stock or when made to specifications.



Prices on Application

We are also equipped to incorporate slots for keyways in drills that are part of a tool assembly.

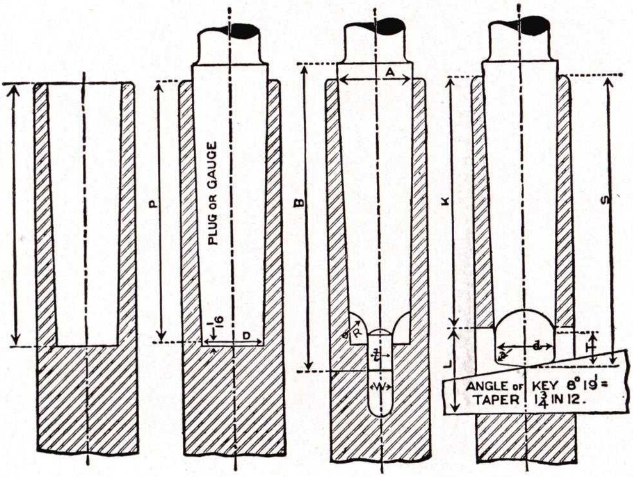
MORSE TAPERS



			SHANK				TONGUE					Keyway					
Number of Taper	Diameter of Plug at Small End	Diameter at End of Socket	Whole Length of Shank	Shank Depth	Depth of Hole	Standard Plug Depth	Thickness of Tongue	Length of Tongue	Radius of Mill for Tongue	Diameter of Tongue	Radius of Tongue	Width of Keyway	Length of Keyway	End of Socket to Keyway	Taper per Foot	Taper per Inch	Number of Key
	D	A	B	S	H	P	t	T	R	d	a	W	L	K			
0	.252	.3561	2⅜	2 7/32	2 1/32	2	5/32	¼	5/32	.235	.04	.160	9/16	1 15/16	.625	.05208	0
1	.369	.475	2⅝	2 7/16	2 3/16	2⅛	13/64	⅜	3/16	.343	.05	.213	¾	2 1/16	.600	.05	1
2	.572	.700	3⅛	2 15/16	2⅝	2 9/16	¼	7/16	¼	17/32	.06	.260	⅞	2½	.602	.05016	2
3	.778	.938	3⅞	3 11/16	3¼	3 3/16	5/16	9/16	9/32	23/32	.08	.322	1 3/16	3 1/16	.602	.05016	3
4	1.020	1.231	4⅞	4⅝	4⅛	4 1/16	15/32	⅝	5/16	31/32	.10	.478	1¼	3⅞	.623	.05191	4
5	1.475	1.748	6⅛	5⅞	5¼	5 3/16	⅝	¾	⅜	1 13/32	.12	.635	1½	4 15/16	.630	.0525	5
6	2.116	2.494	8⅝	8¼	7⅜	7¼	¾	1⅛	½	2	.15	.760	1¾	7	.626	.05216	6
7	2.750	3.270	11⅝	11¼	10⅛	10	1⅛	1⅜	¾	2⅝	.18	1.135	2⅝	9½	.625	.05208	7

BROWN & SHARPE TAPERS

WITH TONGUES



Number of Taper	Diameter of Plug at Small End	Diameter at End of Socket	Standard Plug Depth	Whole Length of Shank	Depth of Hole	End of Socket to Keyway	Length of Keyway	Width of Keyway	Length of Tongue	Diameter of Tongue	Thickness of Tongue	Radius of Mill for Tongue	Radius of Tongue	Shank Depth	Taper per Foot	Taper per Inch
	D	A	P	B	H	K	L	W	T	d	t	R	a	S		
4	.35	.402	1 1/4	1 3/4	1 3/8	1 13/64	11/16	.228	11/32	.320	7/32	5/16	.050	1 21/32	.500	.0416
5	.45	.5229	1 3/4	2 9/32	1 7/8	1 11/16	3/4	.260	3/8	.420	1/4	5/16	.060	2 3/16	.500	.0416
6	.50	.599	2 3/8	2 31/32	2 1/2	2 19/64	7/8	.291	7/16	.460	9/32	5/16	.060	2 7/8	.500	.0416
6	.50	.6354	3 1/4	3 27/32	3 3/8	3 11/64	7/8	.291	7/16	.460	9/32	5/16	.060	3 3/4	.500	.0416
7	.60	.725	3	3 5/8	3 1/8	2 29/32	15/16	.322	15/32	.560	5/16	3/8	.070	3 17/32	.500	.0416
7	.60	.7667	4	4 5/8	4 1/8	3 29/32	15/16	.322	15/32	.560	5/16	3/8	.070	4 17/32	.500	.0416
8	.75	.8985	3 9/16	4 1/4	3 11/16	3 29/32	1	.353	1/2	.710	11/32	3/8	.080	4 1/8	.500	.0416
9	.90	1.0667	4	4 3/4	4 1/8	3 7/8	1 1/8	.385	9/16	.860	3/8	7/16	.100	4 5/8	.500	.0416
10	1.0446	1.26	5	6 1/16	5 1/8	4 27/32	1 5/16	.447	21/32	1.01	7/16	1/2	.110	5 23/32	.5161	.043
10	1.0446	1.289	5 11/16	6 3/4	5 13/16	5 17/32	1 5/16	.447	21/32	1.01	7/16	1/2	.110	6 13/32	.5161	.043
10	1.0446	1.312	6 7/32	7 9/32	6 11/32	6 1/16	1 5/16	.447	21/32	1.01	7/16	1/2	.110	6 15/16	.5161	.043
11	1.25	1.53	6 3/4	7 13/16	6 7/8	6 19/32	1 5/16	.447	21/32	1.21	7/16	1/2	.130	7 15/32	.500	.0416
12	1.50	1.797	7 1/8	8 9/32	7 1/4	6 15/16	1 1/2	.510	3/4	1.46	1/2	1/2	.150	7 15/16	.500	.0416

HINTS FOR DRILL POINT GRINDING

Twist Drills will stand more strain in proportion to their size than any other small tool. When a drill breaks, chips, splits up the center, or otherwise gives trouble, it is pretty certain that it is being abused. A few suggestions are given here, which, if followed, will eliminate your main drill troubles. It will also increase production and prolong the life of the drills.

Grinding of Point

Satisfactory results are obtained only when the drill point is ground correctly. This means, first of all, that the two cutting lips are ground on the same angle with the axis of the drill. Our experience shows that a 59 degree angle is best for all general purposes. (See Fig. 1.)

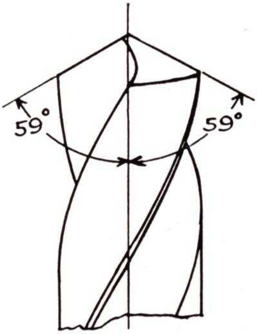


Fig. 1

The clearance angle, or backing off at the point, is perhaps the next important thing to consider. When drilling steel this angle ("A" Fig. 2) should be from 6° to 9°. For soft cast iron and other soft materials this angle may be increased to 12° or even 15° in some cases.

The angle of clearance at the center must be proportional to that at the periphery. Thus, if angle A is made 12 degrees for soft materials, angle B, Figure 3, should be made approximately 135 degrees. When angle A is made 6 degrees to 9 degrees for harder materials, angle B should be made 115 degrees to 120 degrees.

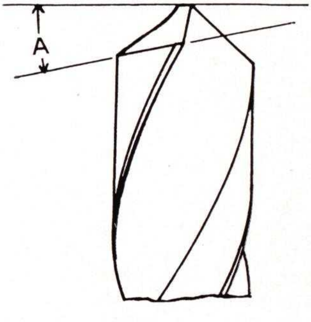


Fig. 2

While insufficient clearance at the center is the cause of drills splitting up the web, it must also be remembered that too much clearance at this point will cause the cutting edges to chip or spall.

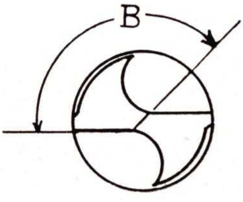


Fig. 3

Continued on next page

If the cutting lips are ground with the same angle, but of different lengths, the point will be off center and will cut holes oversize due to its eccentric action. (See Fig. 4.)

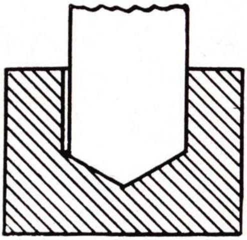


Fig. 4

If lips are not ground at the same angle with the axis, the drill will be subjected to an abnormal torsional strain due to the fact that only one lip will come in contact with the work. This will result in unnecessary breakage and also cause the drill to become dull quickly. (See Fig. 5.)

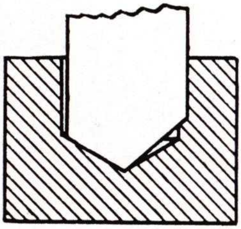


Fig. 5

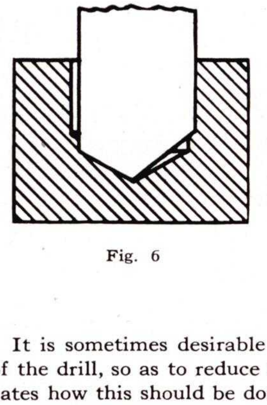


Fig. 6

A drill with cutting lips of a different angle and the point eccentric will produce the combined results as described in Figs. 4 and 5. (See Fig. 6.)

It is sometimes desirable to thin the web at the point of the drill, so as to reduce the end thrust. Figure 7 indicates how this should be done in order to obtain the best results. The web may be reduced to not less than 50—of its original thickness at the point of the drill.

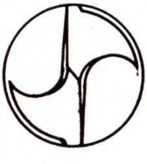


Fig. 7

Speeds and Feeds

The varying conditions under which drills are called upon to perform make it impossible to give any set rules for speeds and feeds. Tables shown on page 62 can be followed when drilling commercial material. When drilling material of unknown hardness the safest way is to start with a slow speed and feed, gradually increasing to a point where the drill shows sign of failure. By this method the right speed and feed can be arrived at for any material.

CAUSES OF FAILURE OR FRACTURE OF TWIST DRILLS

(1) Outside edges of lips wear away rapidly. Indication of too high a cutting speed.

(2) Cutting edges chip. Either feed too heavy or lip clearance too great.

(3) Drill breaks. This can be due to several reasons, such as:

- (a) Point improperly ground.
- (b) Feed too heavy.
- (c) Fracture of the drill due to spring in the work or spring or backlash in the drill press.
- (d) Drill binding in hole due to lands being worn away.
- (e) Fracture while drilling deep holes. Drill clogged with chips.

(4) Broken tang. Due to imperfect fit between taper shank of drill and socket caused by either dirt or chips between the two faces or a burred or badly worn socket.

(5) Drill will not enter work. Drill requires resharpening or not enough lip clearance.

(6) Weaving or wobbling of spindle. Faulty grinding of drill point. Actual point of drill not in the same line as axis of the drill.

(7) Large chip coming out of one flute and practically nothing out of the other. Faulty grinding, one lip doing all the cutting.

(8) Hole oversize. Faulty grinding.

(9) Walls of hole rough. Drills dull or improperly ground.

(10) Drill splits up the center. Too little lip clearance or too heavy a feed.

SUGGESTED SPEEDS AND FEEDS FOR DRILLS

HIGH SPEED STEEL DRILLS

Size of Drill	Feed per Rev.	Bronze Brass 300 feet	Alloy Steel Drop Forging 50 Feet	Cast Iron 140 Feet	Tool St. & Car. St. Drop Forgings 60 Feet	Mild Steel 120 Feet	Malle-able Iron 90 Feet	Cast Steel 40 Feet	Cast Iron Hard 80 Feet
Ins.	Inches	R.P.M.	R.P.M.	R.P.M.	R.P.M.	R.P.M.	R.P.M.	R.P.M.	R.P.M.
1/16	.003	18320	3056	8554	3667	7328	5500	2445	4889
3/32	.0035	12212	2038	5702	2442	4884	3666	1628	3258
1/8	.004	9160	1528	4278	1833	3667	2750	1222	2445
5/32	.0045	7328	1221	3420	1465	2934	2198	976	1954
3/16	.005	6106	1019	2852	1222	2445	1833	815	1630
7/32	.0055	5234	872	2444	1047	2094	1570	698	1396
1/4	.006	4575	764	2139	917	1833	1375	611	1222
9/32	.0065	4071	678	1900	814	1628	1222	542	1084
5/16	.007	3660	611	1711	733	1467	1100	489	978
11/32	.0075	3330	555	1554	666	1332	1000	444	888
3/8	.008	3050	509	1426	611	1222	917	407	815
13/32	.0085	2818	469	1316	563	1126	846	376	752
7/16	.009	2614	437	1222	524	1048	786	349	698
15/32	.0095	2442	407	1140	488	976	732	326	652
1/2	.010	2287	382	1070	458	917	688	306	611
9/16	.0105	2035	339	950	407	814	611	271	543
5/8	.011	1830	306	856	367	733	550	244	489
11/16	.0115	1665	277	777	333	666	500	222	444
3/4	.012	1525	255	713	306	611	458	204	407
13/16	.0125	1409	234	658	281	562	423	188	376
7/8	.013	1307	218	611	262	524	393	175	349
15/16	.0135	1221	203	570	244	488	366	163	326
1	.014	1143	191	535	229	458	344	153	306
1 1/8	.015	1017	170	475	204	407	306	136	272
1 1/4	.016	915	153	428	183	367	275	122	244
1 3/8	.016	833	139	389	167	333	250	111	222
1 1/2	.016	762	127	357	153	306	229	102	204
1 5/8	.016	705	118	329	141	282	212	94	188
1 3/4	.016	654	109	306	131	262	196	87	175
1 7/8	.016	610	102	285	122	244	183	81	163
2	.016	571	95	267	115	229	172	76	153

TABLE OF CUTTING SPEEDS

FRACTION SIZES

Ft. per Min.	30	40	50	60	70	80	90	100	110	120	130	140	150
Dia. In.	Revolutions per Minute												
1/16	1833	2445	3056	3667	4278	4889	....	....	....	....	....	....	....
⅛	917	1222	1528	1833	2139	2445	2750	3056	3361	3667	3973	4278	4584
3/16	611	815	1019	1222	1426	1630	1833	2037	2241	2445	2648	2852	3056
¼	458	611	764	917	1077	1222	1375	1528	1681	1833	1986	2139	2292
5/16	367	489	611	733	856	978	1100	1222	1345	1467	1589	1711	1833
⅜	306	407	509	611	713	815	917	1019	1120	1222	1324	1426	1528
7/16	262	349	437	524	611	698	786	873	960	1048	1135	1222	1310
½	229	306	382	458	535	611	688	764	840	917	993	1070	1146
⅝	183	244	306	367	428	489	550	611	672	733	794	856	917
¾	153	204	255	306	357	407	458	509	560	611	662	713	764
⅞	131	175	218	262	306	349	393	437	480	524	568	611	655
1	115	153	191	229	267	306	344	382	420	458	497	535	573
1⅛	102	136	170	204	238	272	306	340	373	407	441	475	509
1¼	91.7	122	153	183	214	244	275	306	336	367	397	428	458
1⅜	83.3	111	139	167	194	222	250	278	306	333	361	389	417
1½	76.4	102	127	153	178	204	229	255	280	306	331	357	382
1⅝	70.5	94.0	118	141	165	188	212	235	259	282	306	329	353
1¾	65.5	87.3	109	131	153	175	196	218	240	262	284	306	327
1⅞	61.1	81.5	102	122	143	163	183	204	224	244	265	285	306
2	57.3	76.4	95.5	115	134	153	172	191	210	229	248	267	287
2¼	50.9	67.9	84.9	102	119	136	153	170	187	204	221	238	255
2½	45.8	61.1	76.4	91.7	107	122	138	153	168	183	199	214	229
2¾	41.7	55.6	69.5	83.3	97.2	111	125	139	153	167	181	194	208
3	38.2	50.9	63.7	76.4	89.1	102	115	127	140	153	166	178	191
3¼	35.3	47.0	58.8	70.5	82.3	94.0	106	118	129	141	153	165	176
3½	32.7	43.7	54.6	65.5	76.4	87.3	98.2	109	120	131	142	153	164
3¾	30.6	40.7	50.9	61.1	71.3	81.5	91.7	102	112	122	132	143	153
4	28.7	38.2	47.7	57.3	66.8	76.4	85.9	95.5	105	115	124	134	143
4½	25.5	34.0	42.4	50.9	59.4	67.9	76.4	84.9	93.4	102	110	119	127
5	22.9	30.6	38.2	45.8	53.5	61.1	68.8	76.4	84.0	91.7	99.3	107	115
5½	20.8	27.8	34.7	41.7	48.6	55.6	62.5	69.5	76.4	83.3	90.3	97.2	104
6	19.1	25.5	31.8	38.2	44.6	50.9	57.3	63.7	70.0	76.4	82.8	89.1	95.5
6½	17.6	23.5	29.4	35.3	41.1	47.0	52.9	58.8	64.6	70.5	76.4	82.3	88.2
7	16.4	21.8	27.3	32.7	38.2	43.7	49.1	54.6	60.0	65.5	70.9	76.4	81.9
7½	15.3	20.4	25.5	30.6	35.7	40.7	45.8	50.9	56.0	61.1	66.2	71.3	76.4
8	14.3	19.1	23.9	28.7	33.4	38.2	43.0	47.7	52.5	57.3	62.1	66.8	71.6
8½	13.5	18.0	22.5	27.0	31.5	36.0	40.4	44.9	49.4	53.9	58.4	62.9	67.4
9	12.7	17.0	21.2	25.5	29.7	34.0	38.2	42.4	46.7	50.9	55.2	59.4	63.6
9½	12.1	16.1	20.1	24.1	28.2	32.2	36.2	40.2	44.2	48.3	52.3	56.3	60.3
10	11.5	15.3	19.1	22.9	26.7	30.6	34.4	38.2	42.0	45.8	49.7	53.5	57.3
11	10.4	13.9	17.4	20.8	24.3	27.8	31.3	34.7	38.2	41.7	45.1	48.6	52.1
12	9.5	12.7	15.9	19.1	22.3	25.5	28.6	31.8	35.0	38.2	41.4	44.6	47.8
Ft. per Min.	30	40	50	60	70	80	90	100	110	120	130	140	150

TABLE OF CUTTING SPEEDS

WIRE SIZES

Feet per Min.	30	40	50	60	70	80	90	100
Size No.	Revolutions per Minute							
1	503	670	838	1005	1173	1340	1508	1675
2	518	691	864	1037	1210	1382	1555	1728
3	538	717	897	1076	1255	1434	1614	1793
4	548	731	914	1097	1280	1462	1645	1828
5	558	744	930	1115	1301	1487	1673	1859
6	562	749	936	1123	1310	1498	1685	1872
7	570	760	950	1140	1330	1520	1710	1900
8	576	768	960	1151	1343	1535	1727	1919
9	585	780	975	1169	1364	1559	1754	1949
10	592	790	987	1184	1382	1579	1777	1974
11	600	800	1000	1200	1400	1600	1800	2000
12	606	808	1010	1213	1415	1617	1819	2021
13	620	826	1032	1239	1450	1652	1859	2065
14	630	840	1050	1259	1469	1679	1889	2099
15	638	851	1064	1276	1489	1702	1914	2127
16	647	863	1079	1295	1511	1726	1942	2158
17	662	883	1104	1325	1546	1766	1987	2208
18	678	904	1130	1356	1582	1808	2034	2260
19	690	920	1151	1381	1611	1841	2071	2301
20	712	949	1186	1423	1660	1898	2135	2372
21	721	961	1201	1441	1681	1922	2162	2402
22	730	973	1217	1460	1703	1946	2190	2433
23	744	992	1240	1488	1736	1984	2232	2480
24	754	1005	1257	1508	1759	2010	2262	2513
25	767	1022	1276	1533	1789	2044	2300	2555
26	779	1039	1299	1559	1819	2078	2338	2598
27	796	1061	1327	1592	1857	2122	2388	2653
28	816	1088	1360	1631	1903	2175	2447	2719
29	843	1124	1405	1685	1966	2247	2528	2809
30	892	1189	1487	1784	2081	2378	2676	2973
31	955	1273	1592	1910	2228	2546	2865	3183
32	988	1317	1647	1976	2305	2634	2964	3293
33	1014	1352	1690	2028	2366	2704	3042	3380
34	1032	1376	1721	2065	2409	2753	3097	3442
35	1042	1389	1736	2083	2430	2778	3125	3472
36	1076	1435	1794	2152	2511	2870	3228	3587
37	1102	1469	1837	2204	2571	2938	3306	3673
38	1129	1505	1882	2258	2634	3010	3387	3763
39	1152	1536	1920	2303	2687	3071	3455	3839
40	1169	1559	1949	2339	2729	3118	3508	3898
41	1194	1592	1990	2387	2785	3183	3581	3979
42	1226	1634	2043	2451	2860	3268	3677	4085
43	1288	1717	2146	2575	3004	3434	3863	4292
44	1333	1777	2221	2665	3109	3554	3999	4442
45	1397	1863	2329	2795	3261	3726	4192	4658
46	1415	1886	2358	2830	3301	3773	4244	4716
47	1460	1946	2433	2920	3406	3893	4379	4866
48	1508	2010	2513	3016	3518	4021	4523	5026
49	1570	2093	2617	3140	3663	4186	4710	5233
50	1637	2183	2729	3274	3820	4366	4911	5457
51	1710	2280	2851	3421	3991	4561	5131	5701
52	1805	2406	3008	3609	4211	4812	5414	6015
53	1924	2566	3207	3848	4490	5131	5773	6414
54	2084	2778	3473	4167	4862	5556	6251	6945
55	2204	2938	3673	4408	5142	5877	6611	7346
56	2465	3286	4108	4929	5751	6572	7394	8215
57	2671	3561	4452	5342	6232	7122	8013	8903

Concluded on next page.

TABLE OF CUTTING SPEEDS

WIRE SIZES

Continued from preceding page

Ft. per Min. / Size No.	30	40	50	60	70	80	90	100
	Revolutions per Minute							
58	2729	3637	4547	5456	6367	7275	8186	9095
59	2795	3725	4658	5590	6521	7453	8388	9316
60	2865	3820	4775	5729	6684	7639	8594	9549
61	2938	3918	4897	5876	6856	7835	8815	9794
62	3015	4020	5025	6030	7035	8040	9045	10050
63	3096	4128	5160	6192	7224	8256	9288	10320
64	3183	4244	5305	6366	7427	8488	9549	10610
65	3273	4364	5455	6546	7637	8728	9819	10910
66	3474	4632	5790	6948	8106	9264	10422	11580
67	3582	4776	5970	7164	8358	9552	10746	11940
68	3696	4928	6160	7392	8624	9856	11088	12320
69	3918	5224	6530	7836	9142	10488	11754	13060
70	4091	5456	6820	8184	9548	10912	12276	13640
71	4419	5892	7365	8838	10311	11784	13257	14730
72	4584	6112	7640	9168	10696	12224	13752	15280
73	4776	6368	7960	9552	11144	12736	14328	15920
74	5106	6808	8510	10212	11914	13616	15318	17020
75	5457	7276	9095	10914	12733	14552	16371	18190
76	5730	7640	9550	11460	13370	15280	17190	19100
77	6366	8488	10610	12732	14854	16976	19098	21220
78	7161	9548	11935	14322	16709	19096	21483	23870
79	7902	10536	13170	15804	18438	21072	23706	26340
80	8490	11320	14150	16980	19810	22640	25470	28300

TABLE OF CUTTING SPEEDS

LETTER SIZES

Ft. per Min. / Letter Size	30	40	50	60	70	80	90	100
	Revolutions per Minute							
A	491	654	818	982	1145	1309	1472	1636
B	482	642	803	963	1124	1284	1445	1605
C	473	631	789	947	1105	1262	1420	1578
D	467	622	778	934	1089	1245	1400	1556
E	458	611	764	917	1070	1222	1375	1528
F	446	594	743	892	1040	1189	1337	1486
G	440	585	732	878	1024	1170	1317	1463
H	430	574	718	862	1005	1149	1292	1436
I	421	562	702	842	983	1123	1264	1404
J	414	552	690	827	965	1103	1241	1379
K	408	544	680	815	951	1087	1223	1359
L	395	527	659	790	922	1054	1185	1317
M	389	518	648	777	907	1036	1166	1295
N	380	506	633	759	886	1012	1139	1265
O	363	484	605	725	846	967	1088	1209
P	355	473	592	710	828	946	1065	1183
Q	345	460	575	690	805	920	1035	1150
R	338	451	564	676	789	902	1014	1127
S	329	439	549	659	769	878	988	1098
T	320	426	533	640	746	853	959	1066
U	311	415	519	623	727	830	934	1038
V	304	405	507	608	709	810	912	1013
W	297	396	495	594	693	792	891	989
X	289	385	481	576	672	769	865	962
Y	284	378	473	567	662	756	851	945
Z	277	370	462	555	647	740	832	925

ENGLISH INCHES INTO MILLIMETERS

Inch	0	1/16	1/8	3/16	1/4	5/16	3/8	7/16	1/2	9/16	5/8	11/16	3/4	13/16	7/8	15/16
0	0.0	1.6	3.2	4.8	6.4	7.9	9.5	11.1	12.7	14.3	15.9	17.5	19.1	20.6	22.2	23.8
1	25.4	27.0	28.6	30.2	31.7	33.3	34.9	36.5	38.1	39.7	41.3	42.9	44.4	46.0	47.6	49.2
2	50.8	52.4	54.0	55.6	57.1	58.7	60.3	61.9	63.5	65.1	66.7	68.3	69.8	71.4	73.0	74.6
3	76.2	77.8	79.4	81.0	82.5	84.1	85.7	87.3	88.9	90.5	92.1	93.7	95.2	96.8	98.4	100.0
4	101.6	103.2	104.8	106.4	108.0	109.5	111.1	112.7	114.3	115.9	117.5	119.1	120.7	122.2	123.8	125.4
5	127.0	128.6	130.2	131.8	133.4	134.9	136.5	138.1	139.7	141.3	142.9	144.5	146.1	147.6	149.2	150.8
6	152.4	154.0	155.6	157.2	158.8	160.3	161.9	163.5	165.1	166.7	168.3	169.9	171.5	173.0	174.6	176.2
7	177.8	179.4	181.0	182.6	184.2	185.7	187.3	188.9	190.5	192.1	193.7	195.3	196.9	198.4	200.0	201.6
8	203.2	204.8	206.4	208.0	209.6	211.1	212.7	214.3	215.9	217.5	219.1	220.7	222.3	223.8	225.4	227.0
9	228.6	230.2	231.8	233.4	235.0	236.5	238.1	239.7	241.3	242.9	244.5	246.1	247.7	249.2	250.8	252.4
10	254.0	255.6	257.2	258.8	260.4	261.9	263.5	265.1	266.7	268.3	269.9	271.5	273.1	274.6	276.2	277.8
11	279.4	281.0	282.6	284.2	285.7	287.3	288.9	290.5	292.1	293.7	295.3	296.9	298.4	300.0	301.6	303.2
12	304.8	306.4	308.0	309.6	311.1	312.7	314.3	315.9	317.5	319.1	320.7	322.3	323.8	325.4	327.0	328.6
13	330.2	331.8	333.4	335.0	336.5	338.1	339.7	341.3	342.9	344.5	346.1	347.7	349.2	350.8	352.4	354.0
14	355.6	357.2	358.8	360.4	361.9	363.5	365.1	366.7	368.3	369.9	371.5	373.1	374.6	376.2	377.8	379.4
15	381.0	382.6	384.2	385.8	387.3	388.9	390.5	392.1	393.7	394.3	369.9	398.5	400.0	401.6	403.2	404.8
16	406.4	408.0	409.6	411.2	412.7	414.3	415.9	417.5	419.1	420.7	422.3	423.9	425.4	427.0	428.6	430.2
17	431.8	433.4	435.0	436.6	438.1	439.7	441.3	442.9	444.5	446.1	447.7	449.3	450.8	452.4	454.0	455.6
18	457.2	458.8	460.4	462.0	463.5	465.1	466.7	468.3	469.9	471.5	473.1	474.7	476.2	477.8	479.4	481.0
19	482.6	484.2	485.8	487.4	488.9	490.5	492.1	493.7	495.3	496.9	498.5	500.1	501.6	503.2	504.8	506.4
20	508.0	509.6	511.2	512.8	514.3	515.9	517.5	519.1	520.7	522.3	523.9	525.5	527.0	528.6	530.2	531.8
21	533.4	535.0	536.6	538.2	539.7	541.3	542.9	544.5	546.1	547.7	549.3	550.9	552.4	554.0	555.6	557.2
22	558.8	560.4	562.0	563.6	565.1	566.7	568.3	569.9	571.5	573.1	574.7	576.3	577.8	579.4	581.0	582.6
23	584.2	585.8	587.4	589.0	590.5	592.1	593.7	595.3	596.9	598.5	600.1	601.7	603.2	604.8	606.4	608.0

39.37 inches = 1 m. = 10 dm. = 100 cm. = 1000 mm.

DECIMAL EQUIVALENTS OF REGULAR SIZES

Dec.	Inch	Wire	MM.	Dec.	Inch	Wire	MM.	Dec.	Inch	Wire	MM.
.0135		80		.0730		49		.1496			3.8
.0145		79		.0748			1.9	.1520		24	
.0156	1/64			.0760		48		.1535			3.9
.0160		78		.0781	5/64			.1540		23	
.0180		77		.0785		47		.1562	5/32		
.0197			.5	.0787			2.	.1570		22	
.0200		76		.0810		46		.1575			4.
.0210		75		.0820		45		.1590		21	
.0225		74		.0827			2.1	.1610		20	
.0236			.6	.0860		44		.1614			4.1
.0240		73		.0866			2.2	.1654			4.2
.0250		72		.0890		43		.1660		19	
.0260		71		.0905			2.3	.1693			4.3
.0276			.7	.0935		42		.1695		18	
.0280		70		.0937	3/32			.1718	11/64		
.0292		69		.0945			2.4	.1730		17	
.0310		68		.0960		41		.1732			4.4
.0312	1/32			.0980		40		.1770		16	
.0315			.8	.0984			2.5	.1772			4.5
.0320		67		.0995		39		.1800		15	
.0330		66		.1015		38		.1811			4.6
.0350		65		.1024			2.6	.1820		14	
.0354			.9	.1040		37		.1850		13	4.7
.0360		64		.1063			2.7	.1875	3/16		
.0370		63		.1065		36		.1890		12	4.8
.0380		62		.1093	7/64			.1910		11	
.0390		61		.1100		35		.1929			4.9
.0394			1.	.1102			2.8	.1935		10	
.0400		60		.1110		34		.1960		9	
.0410		59		.1130		33		.1968			5.
.0420		58		.1142			2.9	.1990		8	
.0430		57		.1160		32		.2008			5.1
.0433			1.1	.1181			3.	.2010		7	
.0465		56		.1200		31		.2031	13/64		
.0468	3/64			.1220			3.1	.2040		6	
.0472			1.2	.1250	1/8			.2047			5.2
.0512			1.3	.1260			3.2	.2055		5	
.0520		55		.1285		30		.2087			5.3
.0550		54		.1299			3.3	.2090		4	
.0551			1.4	.1339			3.4	.2126			5.4
.0591			1.5	.1360		29		.2130		3	
.0595		53		.1378			3.5	.2165			5.5
.0625	1/16			.1405		28		.2187	7/32		
.0630			1.6	.1406	9/64			.2205			5.6
.0635		52		.1417			3.6	.2210		2	
.0669			1.7	.1440		27		.2244			5.7
.0670		51		.1457			3.7	.2280		1	
.0700		50		.1470		26		.2283			5.8
.0709			1.8	.1495		25		.2323			5.9

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DECIMAL EQUIVALENTS OF REGULAR SIZES

Continued from preceding page

Decimal	Inch	Letter Size	MM.	Decimal	Inch	Letter Size	MM.	Decimal	Inch	MM.
.2340		A		.3386			8.6	.5906		15.
.2343	15/64			.3390		R		.5937	19/32	
.2362			6.	.3425			8.7	.6093	39/64	
.2380		B		.3437	11/32			.6102		15.5
.2401			6.1	.3465			8.8	.6250	5/8	
.2420		C		.3480		S		.6299		16.
.2441			6.2	.3504			8.9	.6406	41/64	
.2460		D		.3543			9.	.6496		16.5
.2480			6.3	.3580		T		.6562	21/32	
.2500	1/4	E		.3583			9.1	.6693		17.0
.2520			6.4	.3593	23/64			.6718	43/64	
.2559			6.5	.3622			9.2	.6875	11/16	
.2570		F		.3661			9.3	.6890		17.5
.2598			6.6	.3680		U		.7031	45/64	
.2610		G		.3701			9.4	.7087		18.
.2638			6.7	.3740			9.5	.7187	23/32	
.2656	17/64			.3750	3/8			.7283		18.5
.2660		H		.3770		V		.7343	47/64	
.2677			6.8	.3780			9.6	.7480		19.
.2716			6.9	.3819			9.7	.7500	3/4	
.2720		I		.3858			9.8	.7656	49/64	
.2756			7.	.3860		W		.7677		19.5
.2770		J		.3898			9.9	.7812	25/32	
.2795			7.1	.3906	25/64			.7874		20.
.2811		K		.3937			10.	.7968	51/64	
.2812	9/32			.3970		X		.8071		20.5
.2835			7.2	.4040		Y		.8125	13/16	
.2874			7.3	.4062	13/32			.8268		21.
.2900		L		.4130		Z		.8281	53/64	
.2913			7.4	.4134			10.5	.8437	27/32	
.2950		M		.4218	27/64			.8465		21.5
.2953			7.5	.4330			11.	.8593	55/64	
.2968	19/64			.4375	7/16			.8661		22.
.2992			7.6	.4528			11.5	.8750	7/8	
.3020		N		.4531	29/64			.8858		22.5
.3031			7.7	.4687	15/32			.8906	57/64	
.3071			7.8	.4724			12.	.9055		23.
.3110			7.9	.4843	31/64			.9062	29/32	
.3125	5/16			.4921			12.5	.9218	59/64	
.3150			8.	.5000	1/2			.9252		23.5
.3160		O		.5118			13.	.9375	15/16	
.3189			8.1	.5156	33/64			.9449		24.
.3228			8.2	.5312	17/32			.9531	61/64	
.3230		P		.5315			13.5	.9646		24.5
.3268			8.3	.5468	35/64			.9687	31/32	
.3281	21/64			.5512			14.	.9843		25.
.3307			8.4	.5625	9/16			.9843	63/64	
.3320		Q		.5709			14.5	1.0000	1	
.3346			8.5	.5781	37/64					

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DECIMAL EQUIVALENTS OF REGULAR SIZES

Continued from preceding page

Decimal	Inch	MM.	Decimal	Inch	MM.	Decimal	Inch	MM.
1.0040		25.5	1.4370		36.5	1.8593	1 55/64	
1.0156	1 1/64		1.4375	1 7/16		1.8701		47.5
1.0236		26.	1.4531	1 29/64		1.8750	1 7/8	
1.0312	1 1/32		1.4567		37.	1.8898		48.
1.0433		26.5	1.4687	1 15/32		1.8906	1 57/64	
1.0468	1 3/64		1.4764		37.5	1.9062	1 29/32	
1.0625	1 1/16		1.4843	1 31/64		1.9095		48.5
1.0630		27.	1.4961		38.	1.9218	1 59/64	
1.0781	1 5/64		1.5000	1 1/2		1.9291		49.
1.0827		27.5	1.5156	1 33/64		1.9375	1 15/16	
1.0937	1 3/32		1.5158		38.5	1.9488		49.5
1.1024		28.	1.5312	1 17/32		1.9531	1 61/64	
1.1093	1 7/64		1.5354		39.	1.9685		50.
1.1220		28.5	1.5468	1 35/64		1.9687	1 31/32	
1.1250	1 1/8		1.5551		39.5	1.9843	1 63/64	
1.1406	1 9/64		1.5625	1 9/16		1.9882		50.5
1.1417		29.	1.5748		40.	2.0000	2	
1.1562	1 5/32		1.5781	1 37/64		2.0079		51.
1.1614		29.5	1.5937	1 19/32		2.0156	2 1/64	
1.1718	1 11/64		1.5945		40.5	2.0276		51.5
1.1811		30.	1.6093	1 39/64		2.0312	2 1/32	
1.1875	1 3/16		1.6142		41.	2.0468	2 3/64	
1.2008		30.5	1.6250	1 5/8		2.0473		52.
1.2031	1 13/64		1.6339		41.5	2.0625	2 1/16	
1.2187	1 7/32		1.6406	1 41/64		2.0669		52.5
1.2205		31.	1.6536		42.	2.0781	2 5/64	
1.2343	1 15/64		1.6562	1 21/32		2.0867		53.
1.2402		31.5	1.6718	1 43/64		2.0937	2 3/32	
1.2500	1 1/4		1.6732		42.5	2.1063		53.5
1.2599		32.	1.6875	1 11/16		2.1093	2 7/64	
1.2656	1 17/64		1.6929		43.	2.1250	2 1/8	
1.2795		32.5	1.7031	1 45/64		2.1260		54.
1.2812	1 9/32		1.7126		43.5	2.1406	2 9/64	
1.2968	1 19/64		1.7187	1 23/32		2.1457		54.5
1.2992		33.	1.7323		44.	2.1562	2 5/32	
1.3125	1 5/16		1.7343	1 47/64		2.1654		55.
1.3189		33.5	1.7500	1 3/4		2.1718	2 11/64	
1.3281	1 21/64		1.7520		44.5	2.1850		55.5
1.3386		34.	1.7656	1 49/64		2.1875	2 3/16	
1.3437	1 11/32		1.7717		45.	2.2031	2 13/64	
1.3583		34.5	1.7812	1 25/32		2.2047		56.
1.3593	1 23/64		1.7914		45.5	2.2187	2 7/32	
1.3750	1 3/8		1.7968	1 51/64		2.2244		56.5
1.3780		35.	1.8110		46.	2.2343	2 15/64	
1.3906	1 25/64		1.8125	1 13/16		2.2441		57.
1.3977		35.5	1.8281	1 53/64		2.2500	2 1/4	
1.4062	1 13/32		1.8307		46.5	2.2638		57.5
1.4173		36.	1.8437	1 27/32		2.2656	2 17/64	
1.4218	1 27/64		1.8504		47.	2.2812	2 9/32	

Concluded on next page.

DECIMAL EQUIVALENTS OF REGULAR SIZES

Continued from preceding page

Decimal	Inch	MM.	Decimal	Inch	MM.	Decimal	Inch
2.2835		58.	2.7165		69.	3.2500	$3\frac{1}{4}$
2.2968	$2\frac{19}{64}$		2.7187	$2\frac{23}{32}$		3.2656	$3\frac{17}{64}$
2.3031		58.5	2.7343	$2\frac{47}{64}$		3.2812	$3\frac{9}{32}$
2.3125	$2\frac{5}{16}$		2.7362		69.5	3.2968	$3\frac{19}{64}$
2.3228		59.	2.7500	$2\frac{3}{4}$		3.3125	$3\frac{5}{16}$
2.3281	$2\frac{21}{64}$		2.7559		70.	3.3281	$3\frac{21}{64}$
2.3425		59.5	2.7656	$2\frac{49}{64}$		3.3437	$3\frac{11}{32}$
2.3437	$2\frac{11}{32}$		2.7756		70.5	3.3593	$3\frac{23}{64}$
2.3593	$2\frac{23}{64}$		2.7812	$2\frac{25}{32}$		3.3750	$3\frac{3}{8}$
2.3622		60.	2.7953		71.	3.3906	$3\frac{25}{64}$
2.3750	$2\frac{3}{8}$		2.7968	$2\frac{51}{64}$		3.4062	$3\frac{13}{32}$
2.3819		60.5	2.8125	$2\frac{13}{16}$		3.4218	$3\frac{27}{64}$
2.3906	$2\frac{25}{64}$		2.8150		71.5	3.4375	$3\frac{7}{16}$
2.4016		61.	2.8281	$2\frac{53}{64}$		3.4531	$3\frac{29}{64}$
2.4062	$2\frac{13}{32}$		2.8346		72.	3.4687	$3\frac{15}{32}$
2.4213		61.5	2.8437	$2\frac{27}{32}$		3.4843	$3\frac{31}{64}$
2.4218	$2\frac{27}{64}$		2.8543		72.5	3.5000	$3\frac{1}{2}$
2.4375	$2\frac{7}{16}$		2.8593	$2\frac{55}{64}$		3.5156	$3\frac{33}{64}$
2.4409		62.	2.8740		73.	3.5312	$3\frac{17}{32}$
2.4531	$2\frac{29}{64}$		2.8750	$2\frac{7}{8}$		3.5468	$3\frac{35}{64}$
2.4606		62.5	2.8906	$2\frac{57}{64}$		3.5625	$3\frac{9}{16}$
2.4687	$2\frac{15}{32}$		2.8937		73.5	3.5781	$3\frac{37}{64}$
2.4803		63.	2.9062	$2\frac{29}{32}$		3.5937	$3\frac{19}{32}$
2.4843	$2\frac{31}{64}$		2.9134		74.	3.6093	$3\frac{39}{64}$
2.5000	$2\frac{1}{2}$	63.5	2.9218	$2\frac{59}{64}$		3.6250	$3\frac{5}{8}$
2.5156	$2\frac{33}{64}$		2.9331		74.5	3.6406	$3\frac{41}{64}$
2.5197		64.	2.9375	$2\frac{15}{16}$		3.6562	$3\frac{21}{32}$
2.5312	$2\frac{17}{32}$		2.9527		75.	3.6718	$3\frac{43}{64}$
2.5394		64.5	2.9531	$2\frac{61}{64}$		3.6875	$3\frac{11}{16}$
2.5468	$2\frac{35}{64}$		2.9687	$2\frac{31}{32}$		3.7031	$3\frac{45}{64}$
2.5590		65.	2.9724		75.5	3.7187	$3\frac{23}{32}$
2.5625	$2\frac{9}{16}$		2.9843	$2\frac{63}{64}$		3.7343	$3\frac{47}{64}$
2.5781	$2\frac{37}{64}$		2.9921		76.	3.7500	$3\frac{3}{4}$
2.5787		65.5	3.0000	3		3.7656	$3\frac{49}{64}$
2.5937	$2\frac{19}{32}$		3.0156	$3\frac{1}{64}$		3.7812	$3\frac{25}{32}$
2.5984		66.	3.0312	$3\frac{1}{32}$		3.7968	$3\frac{51}{64}$
2.6093	$2\frac{39}{64}$		3.0468	$3\frac{3}{64}$		3.8125	$3\frac{13}{16}$
2.6181		66.5	3.0625	$3\frac{1}{16}$		3.8281	$3\frac{53}{64}$
2.6250	$2\frac{5}{8}$		3.0781	$3\frac{5}{64}$		3.8437	$3\frac{27}{32}$
2.6378		67.	3.0937	$3\frac{3}{32}$		3.8593	$3\frac{55}{64}$
2.6406	$2\frac{41}{64}$		3.1093	$3\frac{7}{64}$		3.8750	$3\frac{7}{8}$
2.6562	$2\frac{21}{32}$		3.1250	$3\frac{1}{8}$		3.8906	$3\frac{57}{64}$
2.6575		67.5	3.1406	$3\frac{9}{64}$		3.9062	$3\frac{29}{32}$
2.6718	$2\frac{43}{64}$		3.1562	$3\frac{5}{32}$		3.9218	$3\frac{59}{64}$
2.6772		68.	3.1718	$3\frac{11}{64}$		3.9375	$3\frac{15}{16}$
2.6875	$2\frac{11}{16}$		3.1875	$3\frac{3}{16}$		3.9531	$3\frac{61}{64}$
2.6968		68.5	3.2031	$3\frac{13}{64}$		3.9687	$3\frac{31}{32}$
2.7031	$2\frac{45}{64}$		3.2187	$3\frac{7}{32}$		3.9843	$3\frac{63}{64}$
			3.2343	$3\frac{15}{64}$		4.0000	4

SOLUTION OF TRIANGLES BY NATURAL LINES

Parts Given	TO OBTAIN				
	Angle	Adj. Side	Op. Side	Hypoth.	Op. Angle
Op. & Hyp.	$\text{Sin.} = \frac{\text{Op.}}{\text{Hyp.}}$	$\sqrt{\text{Hyp.}^2 - \text{Op.}^2}$			$\text{Cos.} = \frac{\text{Op.}}{\text{Hyp.}}$
Op. & Adj.	$\text{Tan.} = \frac{\text{Op.}}{\text{Adj.}}$			$\sqrt{\text{Op.}^2 - \text{Adj.}^2}$	$\text{Cot.} = \frac{\text{Op.}}{\text{Adj.}}$
Adj. & Hyp.	$\text{Cos.} = \frac{\text{Adj.}}{\text{Hyp.}}$				
Ang. & Op.		Op. × Cot.		Op. ÷ Sin.	90°—Ang.
Ang. & Adj.			Adj. × Tan.	Adj. ÷ Cos.	90°—Ang.
Ang. & Hyp.		Hyp. × Cos.	Hyp. × Sin.		90°—Ang.

ANGLES CORRESPONDING WITH PARTS OF A CIRCLE

Parts	Angle	Parts	Angle	Parts	Angle	Parts	Angle
1	360°	22	16.36°	43	8.37°	78	4.62°
2	180°	23	15.65°	44	8.18°	80	4.5°
3	120°	24	15°	45	8°	82	4.34°
4	90°	25	14.4°	46	7.83°	84	4.29°
5	72°	26	13.85°	47	7.66°	86	4.19°
6	60°	27	13.33°	48	7.5°	88	4.09°
7	51.43°	28	12.86°	49	7.35°	90	4°
8	45°	29	12.41°	50	7.2°	92	3.91°
9	40°	30	12°	52	6.92°	94	3.83°
10	36°	31	11.61°	54	6.67°	96	3.75°
11	32.73°	32	11.25°	56	6.43°	98	3.67°
12	30°	33	10.91°	58	6.21°	100	3.6°
13	27.69°	34	10.59°	60	6°	102	3.53°
14	25.71°	35	10.29°	62	5.81°	104	3.46°
15	24°	36	10°	64	5.63°	106	3.40°
16	22.5°	37	9.73°	66	5.46°	108	3.33°
17	21.18°	38	9.47°	68	5.29°	110	3.27°
18	20°	39	9.23°	70	5.14°	120	3°
19	18.95°	40	9°	72	5°	130	2.77°
20	18°	41	8.78°	74	4.86°	140	2.57°
21	17.14°	42	8.57°	76	4.74°	150	2.4°

WEIGHT PER INCH

Of Round Bars of Carbon and High Speed Steel in pounds per linear inch

Diam. of Bar Inches	Weight of Bar One Inch Long	
	Carbon Steel	High Speed Steel
1/16	.00087	.00098
1/8	.0035	.0039
3/16	.0078	.0088
1/4	.0139	.0156
5/16	.0217	.0244
3/8	.0313	.0352
7/16	.0425	.0478
1/2	.0556	.0625
9/16	.0703	.0791
5/8	.0868	.0976
11/16	.105	.118
3/4	.125	.141
13/16	.147	.165
7/8	.170	.191
15/16	.195	.219
1	.22	.248
1 1/16	.25	.281
1 1/8	.28	.315
1 3/16	.31	.349
1 1/4	.35	.397
1 5/16	.38	.427
1 3/8	.42	.472
1 7/16	.46	.517
1 1/2	.50	.562
1 9/16	.54	.607
1 5/8	.59	.663
1 11/16	.63	.709
1 3/4	.68	.765
1 13/16	.73	.821
1 7/8	.78	.877
1 15/16	.83	.933
2	.89	1.001
2 1/16	.94	1.057
2 1/8	1.00	1.125
2 3/16	1.06	1.192
2 1/4	1.13	1.271
2 5/16	1.19	1.338
2 3/8	1.25	1.406
2 7/16	1.33	1.496
2 1/2	1.39	1.563
2 9/16	1.46	1.642
2 5/8	1.53	1.721
2 11/16	1.61	1.811
2 3/4	1.68	1.890
2 13/16	1.76	1.980
2 7/8	1.84	2.070
2 15/16	1.92	2.160
3	2.00	2.250
3 1/16	2.08	2.340
3 1/8	2.17	2.441
3 3/16	2.26	2.542
3 1/4	2.35	2.643
3 5/16	2.44	2.745
3 3/8	2.53	2.846
3 7/16	2.63	2.958
3 1/2	2.72	3.060
3 9/16	2.82	3.172
3 5/8	2.92	3.285
3 11/16	3.02	3.397
3 3/4	3.13	3.521
3 13/16	3.23	3.633
3 7/8	3.34	3.757
3 15/16	3.45	3.881
4	3.56	4.005
4 1/16	3.67	4.128
4 1/8	3.78	4.252
4 3/16	3.90	4.387
4 1/4	4.01	4.511
4 5/16	4.13	4.646
4 3/8	4.25	4.781
4 7/16	4.38	4.927
4 1/2	4.50	5.062
4 9/16	4.63	5.208
4 5/8	4.75	5.343
4 11/16	4.88	5.490
4 3/4	5.01	5.636
4 13/16	5.15	5.793
4 7/8	5.28	5.940
4 15/16	5.42	6.097
5	5.56	6.255
5 1/16	5.70	6.412
5 1/8	5.84	6.570
5 3/16	5.98	6.727
5 1/4	6.13	6.896
5 5/16	6.27	7.053
5 3/8	6.42	7.222
5 7/16	6.57	7.391
5 1/2	6.72	7.560
5 9/16	6.88	7.740
5 5/8	7.03	7.908
5 11/16	7.19	8.088
5 3/4	7.35	8.268
5 13/16	7.51	8.448
5 7/8	7.67	8.628
5 15/16	7.84	8.820
6	8.00	9.000
6 1/8	8.34	9.382
6 1/4	8.68	9.765
6 3/8	9.03	10.16
6 1/2	9.39	10.56
6 5/8	9.76	10.98
6 3/4	10.1	11.36
6 7/8	10.5	11.81
7	10.9	12.26
7 1/8	11.3	12.71
7 1/4	11.7	13.16
7 3/8	12.1	13.61
7 1/2	12.5	14.06
7 5/8	12.9	14.51
7 3/4	13.3	14.96
7 7/8	13.8	15.52
8	14.3	16.08
.....	.....	.....
.....	.....	.....

WEIGHTS OF ROUND AND SQUARE STEEL LINEAL FOOT

Based on 489.6 lbs. per cubic foot

Size Inches	Weight of Round 1 foot Long	Weight of Square 1 foot Long	Size Inches	Weight of Round 1 foot Long	Weight of Square 1 foot Long	Size Inches	Weight of Round 1 foot Long	Weight of Square 1 foot Long
1/32	.0026	.0033	3	24.03	30.60	6	96.14	122.4
1/16	.0104	.0133	3 1/16	25.04	31.89	6 1/16	98.14	125.0
1/8	.0417	.0531	3 1/8	26.08	33.20	6 1/8	100.2	127.6
3/16	.0938	.1195	3 3/16	27.13	34.55	6 3/16	102.2	130.2
1/4	.1669	.2123	3 1/4	28.20	35.92	6 1/4	104.3	132.8
5/16	.2608	.3333	3 5/16	29.30	37.31	6 5/16	106.4	135.5
3/8	.3756	.4782	3 3/8	30.42	38.73	6 3/8	108.5	138.2
7/16	.5111	.6508	3 7/16	31.56	40.18	6 7/16	110.7	140.9
1/2	.6676	.8500	3 1/2	32.71	41.65	6 1/2	112.8	143.6
9/16	.8449	1.076	3 9/16	33.90	43.14	6 9/16	114.9	146.5
5/8	1.043	1.328	3 5/8	35.09	44.68	6 5/8	117.2	149.2
11/16	1.262	1.608	3 11/16	36.31	46.24	6 11/16	119.4	152.1
3/4	1.502	1.913	3 3/4	37.56	47.82	6 3/4	121.7	154.9
13/16	1.763	2.245	3 13/16	38.81	49.42	6 13/16	123.9	157.8
7/8	2.044	2.603	3 7/8	40.10	51.05	6 7/8	126.2	160.8
15/16	2.347	2.989	3 15/16	41.40	52.71	6 15/16	128.5	163.6
1	2.670	3.400	4	42.73	54.40	7	130.9	166.6
1 1/16	3.014	3.838	4 1/16	44.07	56.11	7 1/8	135.6	172.6
1 1/8	3.379	4.303	4 1/8	45.44	57.85	7 1/4	140.4	178.7
1 3/16	3.766	4.795	4 3/16	46.83	59.62	7 3/8	145.3	184.9
1 1/4	4.173	5.312	4 1/4	48.24	61.41	7 1/2	150.2	191.3
1 5/16	4.600	5.857	4 5/16	49.66	63.23	7 5/8	155.2	197.7
1 3/8	5.019	6.428	4 3/8	51.11	65.08	7 3/4	160.3	204.2
1 7/16	5.518	7.026	4 7/16	52.58	66.95	7 7/8	165.6	210.8
1 1/2	6.008	7.650	4 1/2	54.07	68.85	8	171.0	217.6
1 9/16	6.520	8.301	4 9/16	55.59	70.78	8 1/8	176.3	224.5
1 5/8	7.051	8.978	4 5/8	57.12	73.73	8 1/4	181.8	231.4
1 11/16	7.604	9.682	4 11/16	58.67	74.70	8 3/8	187.3	238.5
1 3/4	8.178	10.41	4 3/4	60.25	76.71	8 1/2	193.0	245.6
1 13/16	8.773	11.17	4 13/16	61.84	78.74	8 5/8	198.7	252.9
1 7/8	9.388	11.95	4 7/8	63.46	80.81	8 3/4	204.4	260.3
1 15/16	10.02	12.76	4 15/16	65.10	82.89	8 7/8	210.3	267.9
2	10.68	13.60	5	66.76	85.00	9	216.3	275.4
2 1/16	11.36	14.46	5 1/16	68.44	87.14	9 1/8	222.4	283.2
2 1/8	12.06	15.35	5 1/8	70.14	89.30	9 1/4	228.5	291.1
2 3/16	12.78	16.27	5 3/16	71.86	91.49	9 3/8	234.7	298.9
2 1/4	13.52	17.22	5 1/4	73.60	93.72	9 1/2	241.0	306.8
2 5/16	14.28	18.19	5 5/16	75.37	95.96	9 5/8	247.4	315.0
2 3/8	15.07	19.18	5 3/8	77.15	98.23	9 3/4	253.9	323.2
2 7/16	15.86	20.20	5 7/16	78.95	100.5	9 7/8	260.4	331.6
2 1/2	16.69	21.25	5 1/2	80.77	102.8	10	267.0	340.0
2 9/16	17.53	22.33	5 9/16	82.62	105.2	10 1/4	280.6	357.2
2 5/8	18.40	23.43	5 5/8	84.49	107.6	10 1/2	294.4	374.9
2 11/16	19.29	24.56	5 11/16	86.38	110.0	10 3/4	308.6	392.9
2 3/4	20.20	25.00	5 3/4	88.29	112.4	11	323.1	411.4
2 13/16	21.12	26.90	5 13/16	90.22	114.9	11 1/4	337.9	430.3
2 7/8	22.07	28.10	5 7/8	92.17	117.4	11 1/2	353.1	449.6
2 15/16	23.04	29.34	5 15/16	94.14	119.9	11 3/4	368.6	469.4

TEMPERATURE CONVERSION TABLE

Albert Sauveur

0 TO 100						100 TO 1000					
C		F	C		F	C		F	C		F
−17.7	**0**	32	9.9	**50**	122.0	38	**100**	212	260	**500**	932
−17.2	**1**	33.8	10.4	**51**	123.8	43	**110**	230	265	**510**	950
−16.6	**2**	35.6	11.1	**52**	125.6	49	**120**	248	271	**520**	968
−16.1	**3**	37.4	11.5	**53**	127.4	54	**130**	266	276	**530**	986
−15.5	**4**	39.2	12.1	**54**	129.2	60	**140**	284	282	**540**	1004
−15.0	**5**	41.0	12.6	**55**	131.0	65	**150**	302	288	**550**	1022
−14.4	**6**	42.8	13.2	**56**	132.8	71	**160**	320	293	**560**	1040
−13.9	**7**	44.6	13.7	**57**	134.6	76	**170**	338	299	**570**	1058
−13.3	**8**	46.4	14.3	**58**	136.4	83	**180**	356	304	**580**	1076
−12.7	**9**	48.2	14.8	**59**	138.2	88	**190**	374	310	**590**	1094
−12.2	**10**	50.0	15.6	**60**	140.0	93	**200**	392	315	**600**	1112
−11.6	**11**	51.8	16.1	**61**	141.8	99	**210**	410	321	**610**	1130
−11.1	**12**	53.6	16.6	**62**	143.6	100	**212**	413	326	**620**	1148
−10.5	**13**	55.4	17.1	**63**	145.4	104	**220**	428	332	**630**	1166
−10.0	**14**	57.2	17.7	**64**	147.2	110	**230**	446	338	**640**	1184
− 9.4	**15**	59.0	18.2	**65**	149.0	115	**240**	464	343	**650**	1202
− 8.8	**16**	61.8	18.8	**66**	150.8	121	**250**	482	349	**660**	1220
− 8.3	**17**	63.6	19.3	**67**	152.6	127	**260**	500	354	**670**	1238
− 7.7	**18**	65.4	19.9	**68**	154.4	132	**270**	518	360	**680**	1256
− 7.2	**19**	67.2	20.4	**69**	156.2	138	**280**	536	365	**690**	1274
− 6.6	**20**	68.0	21.0	**70**	158.0	143	**290**	554	371	**700**	1292
− 6.1	**21**	69.8	21.5	**71**	159.8	149	**300**	572	376	**710**	1310
− 5.5	**22**	71.6	22.2	**72**	161.6	154	**310**	590	382	**720**	1328
− 5.0	**23**	73.4	22.7	**73**	163.4	160	**320**	608	387	**730**	1346
− 4.4	**24**	75.2	23.3	**74**	165.2	165	**330**	626	393	**740**	1364
− 3.9	**25**	77.0	23.8	**75**	167.0	171	**340**	644	399	**750**	1382
− 3.3	**26**	78.8	24.4	**76**	168.8	177	**350**	662	404	**760**	1400
− 2.8	**27**	80.6	25.0	**77**	170.6	182	**360**	680	410	**770**	1418
− 2.2	**28**	82.4	25.5	**78**	172.4	188	**370**	698	415	**780**	1436
− 1.6	**29**	84.2	26.2	**79**	174.2	193	**380**	716	421	**790**	1454
− 1.1	**30**	86.0	26.8	**80**	176.0	199	**390**	734	426	**800**	1472
− .6	**31**	87.8	27.3	**81**	177.8	204	**400**	752	432	**810**	1490
0.	**32**	89.6	27.7	**82**	179.6	210	**410**	770	438	**820**	1508
.5	**33**	91.4	28.2	**83**	181.4	215	**420**	788	443	**830**	1526
1.1	**34**	93.2	28.8	**84**	183.2	221	**430**	806	449	**840**	1544
1.6	**35**	95.0	29.3	**85**	185.0	226	**440**	824	454	**850**	1562
2.2	**36**	96.8	29.9	**86**	186.8	232	**450**	842	460	**860**	1580
2.7	**37**	98.6	30.4	**87**	188.6	238	**460**	860	465	**870**	1598
3.3	**38**	100.4	31.0	**88**	190.4	243	**470**	878	471	**880**	1616
3.8	**39**	102.2	31.5	**89**	192.2	249	**480**	896	476	**890**	1634
4.4	**40**	104.0	32.1	**90**	194.0	254	**490**	914	482	**900**	1652
4.9	**41**	105.8	32.6	**91**	195.8				487	**910**	1670
5.5	**42**	107.6	33.3	**92**	197.6				493	**920**	1688
6.0	**43**	109.4	33.8	**93**	199.4				498	**930**	1706
6.6	**44**	111.2	34.4	**94**	201.2				504	**940**	1724
7.1	**45**	113.0	34.9	**95**	203.0				510	**950**	1742
7.7	**46**	114.8	35.5	**96**	204.8				515	**960**	1760
8.2	**47**	116.6	36.1	**97**	206.6				520	**970**	1778
8.8	**48**	118.4	36.6	**98**	208.4				526	**980**	1796
9.3	**49**	120.2	37.1	**99**	210.2				532	**990**	1814
			37.7	**100**	212.0				538	**1000**	1832

NOTE—The numbers in BLUE refer to the temperature either in degrees Centigrade or Fahrenheit which it is desired to convert into the other scale. If converting from Fahrenheit degrees to Centigrade degrees the equivalent temperature will be found in the left column, while if converting from degrees Centigrade to degrees Fahrenheit, the answer will be found in the column to the right.

TEMPERATURE CONVERSION TABLE

Albert Sauveur

1000 TO 2000						2000 TO 3000					
C		F	C		F	C		F	C		F
538	**1000**	1832	815	**1500**	2732	1093	**2000**	3632	1371	**2500**	4532
543	**1010**	1850	820	**1510**	2750	1098	**2010**	3650	1376	**2510**	4550
549	**1020**	1868	827	**1520**	2768	1104	**2020**	3668	1382	**2520**	4568
554	**1030**	1886	831	**1530**	2786	1109	**2030**	3686	1387	**2530**	4586
560	**1040**	1904	838	**1540**	2804	1115	**2040**	3704	1393	**2540**	4604
565	**1050**	1922	842	**1550**	2822	1120	**2050**	3722	1398	**2550**	4622
571	**1060**	1940	849	**1560**	2840	1126	**2060**	3740	1404	**2560**	4640
576	**1070**	1958	853	**1570**	2858	1131	**2070**	3758	1409	**2570**	4658
582	**1080**	1976	860	**1580**	2876	1137	**2080**	3776	1415	**2580**	4676
587	**1090**	1994	864	**1590**	2894	1142	**2090**	3794	1420	**2590**	4694
593	**1100**	2012	871	**1600**	2912	1149	**2100**	3812	1427	**2600**	4712
598	**1110**	2030	876	**1610**	2930	1154	**2110**	3830	1432	**2610**	4730
604	**1120**	2048	882	**1620**	2948	1160	**2120**	3848	1438	**2620**	4748
609	**1130**	2066	887	**1630**	2966	1165	**2130**	3866	1443	**2630**	4766
615	**1140**	2084	893	**1640**	2984	1171	**2140**	3884	1449	**2640**	4784
620	**1150**	2102	898	**1650**	3002	1176	**2150**	3902	1454	**2650**	4802
626	**1160**	2120	904	**1660**	3020	1182	**2160**	3920	1460	**2660**	4820
631	**1170**	2138	909	**1670**	3038	1187	**2170**	3938	1465	**2670**	4838
637	**1180**	2156	915	**1680**	3056	1193	**2180**	3956	1471	**2680**	4856
642	**1190**	2174	920	**1690**	3074	1198	**2190**	3974	1476	**2690**	4874
648	**1200**	2192	926	**1700**	3092	1204	**2200**	3992	1483	**2700**	4892
653	**1210**	2210	931	**1710**	3110	1209	**2210**	4010	1488	**2710**	4910
659	**1220**	2228	937	**1720**	3128	1215	**2220**	4028	1494	**2720**	4928
664	**1230**	2246	942	**1730**	3146	1220	**2230**	4046	1499	**2730**	4946
670	**1240**	2264	948	**1740**	3164	1226	**2240**	4064	1505	**2740**	4964
675	**1250**	2282	953	**1750**	3182	1231	**2250**	4082	1510	**2750**	4982
681	**1260**	2300	959	**1760**	3200	1237	**2260**	4100	1516	**2760**	5000
686	**1270**	2318	964	**1770**	3218	1242	**2270**	4118	1521	**2770**	5018
692	**1280**	2336	970	**1780**	3236	1248	**2280**	4136	1527	**2780**	5036
697	**1290**	2354	975	**1790**	3254	1253	**2290**	4154	1532	**2790**	5054
704	**1300**	2372	981	**1800**	3272	1259	**2300**	4172	1538	**2800**	5072
708	**1310**	2390	986	**1810**	3290	1264	**2310**	4190	1543	**2810**	5090
715	**1320**	2408	992	**1820**	3308	1270	**2320**	4208	1549	**2820**	5108
719	**1330**	2426	997	**1830**	3326	1275	**2330**	4226	1554	**2830**	5126
726	**1340**	2444	1003	**1840**	3344	1281	**2340**	4244	1560	**2840**	5144
734	**1350**	2462	1008	**1850**	3362	1286	**2350**	4262	1565	**2850**	5162
737	**1360**	2480	1014	**1860**	3380	1292	**2360**	4280	1571	**2860**	5180
741	**1370**	2498	1019	**1870**	3398	1297	**2370**	4298	1576	**2870**	5198
748	**1380**	2516	1025	**1880**	3416	1303	**2380**	4316	1582	**2880**	5216
752	**1390**	2534	1030	**1890**	3434	1308	**2390**	4334	1587	**2890**	5234
760	**1400**	2552	1036	**1900**	3452	1315	**2400**	4352	1593	**2900**	5252
765	**1410**	2570	1041	**1910**	3470	1320	**2410**	4370	1598	**2910**	5270
771	**1420**	2588	1047	**1920**	3488	1326	**2420**	4388	1604	**2920**	5288
776	**1430**	2606	1052	**1930**	3506	1331	**2430**	4406	1609	**2930**	5306
782	**1440**	2624	1058	**1940**	3524	1337	**2440**	4424	1615	**2940**	5324
787	**1450**	2642	1063	**1950**	3542	1342	**2450**	4442	1620	**2950**	5342
793	**1460**	2660	1069	**1960**	3560	1348	**2460**	4460	1626	**2960**	5360
798	**1470**	2678	1074	**1970**	3578	1353	**2470**	4478	1631	**2970**	5378
804	**1480**	2696	1080	**1980**	3596	1359	**2480**	4496	1637	**2980**	5396
809	**1490**	2714	1085	**1990**	3614	1364	**2490**	4514	1642	**2990**	5414
			1093	**2000**	3632				1649	**3000**	5432

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HARDNESS CONVERSION TABLE

Introductory Remarks—This table only applies to steel of uniform chemical composition and uniform heat treatment, and is not recommended for non-ferrous metals or for case hardened steels.

The descriptive articles in the Metals Handbook 1936 Edition on the Brinell, Rockwell, scleroscope hardness testing methods should be referred to, and especially the sections in these articles dealing with the applications and precautions to be taken with these instruments.

Approximate Relations Between Brinell, Rockwell, Shore Hardness

Brinell		Rockwell		
Dia. in mm., 3000 kg. load 10 mm. ball	Hardness No.	C 150 kg. load 120° Diamond Cone	B 100 kg. load 1/16 in. dia. ball	Shore Scleroscope No.
2.05	*898*	. .	. . .	. . .
2.10	*857*	. .	. . .	. . .
2.15	*817*	. .	. . .	. . .
2.20	*780*	70	. . .	106
2.25	*745*	68	. . .	100
2.30	*712*	66	. . .	95
2.35	*682*	64	. . .	91
2.40	*653*	62	. . .	87
2.45	*627*	60	. . .	84
2.50	*601*	58	. . .	81
2.55	578	57	. . .	78
2.60	555	55	*120*	75
2.65	534	53	*119*	72
2.70	514	52	*119*	70
2.75	495	50	*117*	67
2.80	477	49	*117*	65
2.85	461	47	*116*	63
2.90	444	46	*115*	61
2.95	429	45	*115*	59
3.00	415	44	*114*	57
3.05	401	42	*113*	55
3.10	388	41	*112*	54
3.15	375	40	*112*	52
3.20	363	38	*110*	51
3.25	352	37	*110*	49
3.30	341	36	*109*	48
3.35	331	35	*109*	46
3.40	321	34	*108*	45
3.45	311	33	*108*	44
3.50	302	32	*107*	43
3.55	293	31	*106*	42
3.60	285	30	*105*	40
3.65	277	29	104	39
3.70	269	28	104	38

Figures in italics are an approximation and are to be used only as a guide.

HARDNESS CONVERSION TABLE

Brinell		Rockwell		
Dia. in mm., 3000 kg. load 10 mm. ball	Hardness No.	C 150 kg. load 120° Diamond Cone	B 100 kg. load 1/16 in. dia. ball	Shore Scleroscope No.
3.75	262	26	103	37
3.80	255	25	102	37
3.85	248	24	102	36
3.90	241	23	100	35
3.95	235	22	99	34
4.00	229	21	98	33
4.05	223	20	97	32
4.10	217	*18*	96	31
4.15	212	*17*	96	31
4.20	207	*16*	95	30
4.25	202	*15*	94	30
4.30	197	*13*	93	29
4.35	192	*12*	92	28
4.40	187	*10*	91	28
4.45	183	*9*	90	27
4.50	179	*8*	89	27
4.55	174	*7*	88	26
4.60	170	*6*	87	26
4.65	166	*4*	86	25
4.70	163	*3*	85	25
4.75	159	*2*	84	24
4.80	156	*1*	83	24
4.85	153	..	82	23
4.90	149	..	81	23
4.95	146	..	80	22
5.00	143	..	79	22
5.05	140	..	78	21
5.10	137	..	77	21
5.15	134	..	76	21
5.20	131	..	74	20
5.25	128	..	73	20
5.30	126	..	72	..
5.35	124	..	71	..
5.40	121	..	70	..
5.45	118	..	69	..
5.50	116	..	68	..
5.55	114	..	67	..
5.60	112	..	66	..
5.65	109	..	65	..
5.70	107	..	64	..
5.75	105	..	62	..
5.80	103	..	61	..
5.85	101	..	60	..
5.90	99	..	59	..
5.95	97	..	57	..
6.00	95	..	56	..

Figures in italics are an approximation and are to be used only as a guide.

TAP DRILL SIZES

NATIONAL COARSE THREAD SERIES

Formerly A. S. M. E. Regular sizes 1-12; U. S. Standard for sizes ¼″ and larger

Size of Tap and No. of Threads per Inch	Recommended Tap Drills			Nearest Other Tap Drills			Nut Minor Diam.	
	Nominal and Decimal Size		Per Cent Full Thread of Nut	Nominal and Decimal Size		Per Cent Full Thread of Nut	Min. 83⅓% Full Thread of Nut	Max. 75% Full Thread of Nut
				No. 16	.1770	72		
No. 12-24	4.4 mm	.1732	79	No. 17	.1730	79	.1709	.1754
				11/64	.1719	82		
				No. 7	.2010	75		
¼″-20	No. 8	.1990	78	5.1 mm	.2008	76	.1959	.2013
				5 mm	.1968	82		
				No. 9	.1960	83		
5/16″-18	6.5 mm	.2559	78	F	.2570	77	.2524	.2584
⅜″-16	7.9 mm	.3110	79	5/16	.3125	77	.3073	.3141
				U	.3680	75		
7/16″-14	9.25 mm	.3642	79	9.3 mm	.3661	77	.3602	.3679
				9.2 mm	.3622	81		
½″-13	27/64	.4219	78				.4167	.4251
9/16″-12	*	.4776	78	31/64	.4843	72	.4723	.4813
				12 mm	.4724	83		
⅝″-11	13.5 mm	.5315	79	17/32	.5312	80	.5266	.5364
¾″-10	*	.6480	79	21/32	.6562	72	.6417	.6526
				16.5 mm	.6496	77		
⅞″-9	*	.7615	79	49/64	.7656	76	.7547	.7667
1″-8	*	.8723	79	⅞	.8750	77	.8647	.8782
				22 mm	.8661	82		
1⅛″-7	*	.9789	79	63/64	.9844	76	.9704	.9858
				25 mm	.9843	76		
1¼″-7	28 mm	1.1024	80	1 7/64	1.1094	76	1.0954	1.1108
1½″-6	1 21/64	1.3281	79	1 11/32	1.3437	72	1.3196	1.3376
				34 mm	1.3386	75		
				39.5 mm	1.5551	75		
1¾″-5	*	1.5453	79	1 35/64	1.5469	78	1.5335	1.5551
				39 mm	1.5354	83		
2″-4½	45 mm	1.7717	79	1 25/32	1.7812	76	1.7594	1.7835
				1 49/64	1.7656	81		
				2 1/32	2.0312	76		
2¼″-4½	*	2.0225	79	51.5 mm	2.0276	77	2.0094	2.0335
				2 1/64	2.0156	81		
2½″-4	57 mm	2.2441	79	2¼	2.2500	77	2.2294	2.2564
				2 15/64	2.2344	82		
				2½	2.5000	77		
2¾″-4	*	2.4939	79	2 31/64	2.4844	82	2.4794	2.5064
				63 mm	2.4803	83		
				70 mm	2.7559	75		
3″-4	*	2.7439	79	2¾	2.7500	77	2.7294	2.7564
				69.5 mm	2.7362	81		
				2 47/64	2.7344	82		

*Regularly furnished. Order by decimal size or size of thread.

TAP DRILL SIZES

NATIONAL FINE THREAD SERIES

Formerly A. S. M. E. Special for sizes 0-12; S. A. E. Standard for sizes 1/4″ and larger

Size of Tap and No. of Threads per Inch	Recommended Tap Drills			Nearest Other Tap Drills			Nut Minor Diam.	
	Nominal and Decimal Size		Per Cent Full Thread of Nut	Nominal and Decimal Size		Per Cent Full Thread of Nut	Min. 83 1/3% Full Thread of Nut	Max. 75% Full Thread of Nut
No. 0-80	1.2 mm	.0472	79	3/64	.0469	81	.0465	.0478
				No. 56	.0465	83		
No. 1-72	1.5 mm	.0591	77	No. 53	.0595	75	.0580	.0595
No. 2-64	No. 50	.0700	79				.0691	.0708
No. 3-56	No. 46	.0810	78	No. 45	.0820	73	.0797	.0816
No. 4-48	*	.0911	77	No. 42	.0935	68	.0894	.0917
				2.3 mm	.0905	79		
No. 5-44	2.6 mm	.1024	77	No. 37	.1040	71	.1004	.1029
				No. 38	.1015	80		
No. 6-40	No. 33	.1130	77	No. 34	.1110	83	.1109	.1136
No. 8-36	No. 29	.1360	78	3.4 mm	.1339	83	.1339	.1369
No. 10-32	No. 21	.1590	76	4 mm	.1575	80	.1562	.1596
				No. 22	.1570	81		
				5/32	.1562	83		
No. 12-28	No. 15	.1800	78	No. 14	.1820	73	.1773	.1812
				4.6 mm	.1811	75		
1/4″-28	No. 3	.2130	80	5.4 mm	.2126	81	.2113	.2152
5/16″-24	*	.2703	78	1	.2720	75	.2674	.2719
				6.9 mm	.2716	76		
				6.8 mm	.2677	83		
3/8″-24	Q	.3320	79	8.4 mm	.3307	82	.3299	.3344
7/16″-20	W	.3860	79	25/64	.3906	72	.3834	.3888
				9.8 mm	.3858	80		
				9.75 mm	.3839	82		
1/2″-20	*	.4492	78	29/64	.4531	72	.4459	.4513
				11.5 mm	.4528	73		
9/16″-18	*	.5062	78	33/64	.5156	65	.5024	.5084
				13 mm	.5118	70		
5/8″-18	*	.5687	78	37/64	.5781	65	.5649	.5709
				14.5 mm	.5709	75		
3/4″-16	11/16	.6875	77	17.5 mm	.6890	75	.6823	.6891
7/8″-14	*	.8024	78	13/16	.8125	67	.7977	.8054
				20.5 mm	.8071	73		
1″-14	*	.9274	78	15/16	.9375	67	.9227	.9304
				23.5 mm	.9252	81		
1 1/8″-12	*	1.0401	78	1 3/64	1.0469	72	1.0348	1.0438
				26.5 mm	1.0433	75		
1 1/4″-12	*	1.1651	78	1 11/64	1.1719	72	1.1598	1.1688
				29.5 mm	1.1614	82		
1 1/2″-12	*	1.4153	78	1 27/64	1.4219	72	1.4098	1.4188
				36 mm	1.4173	76		
1 3/4″-12	*	1.6653	78	42.5 mm	1.6732	71	1.6598	1.6688
				1 43/64	1.6719	72		
2″-12	*	1.9153	78	49 mm	1.9291	65	1.9098	1.9188
				1 59/64	1.9219	72		

*Regularly furnished. Order by decimal size or size of thread.

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